



**Agenda Item 6: Priorities of implementation for the period 2017-2019**

**PROPOSAL OF AIR NAVIGATION IMPLEMENTATION PRIORITIES**

(Presented by the Secretariat)

**SUMMARY**

This working paper presents a proposal of air navigation implementation priorities for the period 2017-2019. This proposal takes into account the status of implementation of the priorities specified in the Bogota Declaration for the end of 2016, as well as possible new air navigation priorities in response to regional and global requirements to meet air traffic growth.

**References:**

- Global Air Navigation Plan (Doc 9750, Fourth edition)
- SAM Performance-based air navigation implementation plan (PBIP)
- Report on the Second Meeting of Air Navigation and Safety Oversight Directors of the SAM Region (Lima, Peru, 14 to 16 September 2015)

**ICAO Strategic Objectives:**

*A - Safety*  
*B – Air navigation capacity and efficiency*  
*E – Environmental protection*

**1 Introduction**

1.1 The Thirteenth Meeting of Civil Aviation Authorities (RAAC/13) approved Conclusion RAAC/13-8 – *Implementation of air navigation and safety priorities*, urging SAM States to implement air navigation and safety priorities in accordance with the regional goals defined in the Bogota Declaration for the period 2014-2016, and international organisations to support the priorities of the States.

1.2 When deciding on implementation priorities, consideration should be given to the high rate of growth of the air transport sector in recent years, and to the identification of possible bottlenecks that prevent sustained growth of air transport. Improved connectivity and continuous safety improvement could be the main strategic axes for the next few years.

1.3 These priorities must be aligned with the requirements of the *SAM Performance-based air navigation implementation plan (PBIP)*, as aligned with the Aviation System Block Upgrade (ASBU) methodology approved by the RAAC/13 meeting through Conclusion RAAC/13-5 – *SAM Performance-based air navigation implementation plan (SAM PBIP) as aligned with the ASBU*.

## 2 Discussion

2.1 The status of implementation of air navigation priorities is presented in detail in Working Paper WP/10 of Agenda Item 4 of this meeting.

2.2 The information shows that some air navigation implementation priorities expected to be accomplished by the end of 2016 will require an additional effort by States in order to meet the proposed goals. In case these are not met, the unmet goals could be included in the priorities for the period 2017-2019.

2.3 The priorities established in the Bogota Declaration responded to regional requirements for the period 2014-2016, and do not reflect all the air navigation requirements of the Global Air Navigation Plan and the Regional PBIP in terms of integration, interoperability, and harmonisation of systems in support of the “Single Sky” concept for international civil aviation. However, they allow States to focus their efforts on priority issues and offer a powerful and easy message to convey to the world and to the higher authorities of the States.

2.4 Global and regional air navigation plans are aimed at keeping pace with air traffic volume worldwide, which has been doubling every 15 years since 1977. It is estimated that this trend will continue in the years ahead. This growth takes place despite the growing recession cycles and shows how investments in aviation can be a key factor for economic recovery.

2.5 Global and regional plans define the means and goals that will allow States and aviation stakeholders to anticipate air traffic growth and manage it efficiently, while maintaining or actively improving safety. Such objectives have been defined in broad consultation with the stakeholders and serve as the basis for the establishment of harmonised measures at global, regional and national level.

2.6 The Second Meeting of Air Navigation and Safety Oversight Directors (AN/FS/2) assessed the proposal of implementation of air navigation priorities for the period 2017-2019 based on the Aviation System Block Upgrade (ASBU) modules, included in the *SAM Performance-based air navigation implementation plan* (PBIP).

2.7 These priorities respond to the global requirements of air navigation, the strategic objectives of ICAO and also fit into the framework of two of the sustainable development goals set by the United Nations for the next 15 years after 2015.

2.8 After its evaluation, the AN&FS/2 recognized that some air navigation implementations considered for 2017-2019 would require metrics review, as the implementation of the module ASBU B0 – CCO and B0 CDO: *Improve efficiency and flexibility in climb and descent profiles applying continuous climb operations (CCO) and continuous descent operations (CDO)*, module ASBU B0-FRTO: *Improve operations through optimised route paths*, module ASBU B0-SUR: *Initial ground surveillance capability (A-SMGCS Level 1-2)* module B0-TBO: *Improved safety and efficiency through the initial application of data link en-route* and the navigation infrastructure supported by modules B0-APTA, B0-CCO and B0-CDO. The revision of the metrics would be made by the Sixteenth Workshop/Meeting of the SAM Implementation Group (SAM/IG/16) to be held in Lima from 16 to 23 October 2015.

2.9 As a result of the review of air navigation implementation priorities for the period 2017-2019 the AN&FS/2 approved the activities considered, but requested that during the Sixteenth Workshop/Meeting of the SAM implementation group (SAM/IG/16, Lima, Peru, 19 to 23 October 2015) metrics and goals of some implementation priorities be assessed by ATM and CNS experts. The

reviewed air navigation priorities for the period 2017-2019 are presented in the **Appendix** to this working paper.

**3 Suggested action**

3.1 The Meeting is invited to:

- a) take note of the information presented herein;
- b) endorse the implementation of the air navigation priorities for the period 2017-2019 considered by the directors of air navigation in AN&FS/2 presented as Appendix to this working paper.

-END-

APPENDIX A

AIR NAVIGATION PRIORITY IMPLEMENTATION PLAN PERIOD 2017- 2019

APPROVED TEMPLATES IN THE ATFM AREA

<i>B0 - CCO and B0 - CDO: Improve efficiency and flexibility in climb and descent profiles applying continuous climb operations (CCO) and continuous descent operations (CDO) 2017-2019</i>				
ELEMENTS	SCOPE	INDICATORS/ METRICS	GOALS: % / Date	STATUS
1- PBN SIDs and PBN STARs  <u>SIDs/STARs in International Airports considered in 2014: 1680</u>	All States	Indicator: % of International Airports with SID or STAR PBN.  Support metrics: Number of International Airports that have implemented SID or STAR PBN.  <b>(Note:</b> This refers to International Airports listed in table AOP-1 of the CAR/SAM ANP).	80% by 2017 100% by 2018	64% of International Airports with PBN SIDs or STARs implemented  (Nr. of airports)
	<b>NOTE</b>	For the 2017-2019 period metrics and indicators will be refined considering one specific metric for SID and another for STAR. The metric for STAR should consider only International Airports with regular international operations.		
2- Design of TMAs applying PBN.  <u>2015 baseline:</u> 34 TMAs selected	All States	Indicator: % of TMAs selected for implementation of the PBN airspace concept that serve International Airports.  Support metrics: Number of TMAs selected for implementation of the PBN airspace concept that serve International Airports.  <b>(Note:</b> this refers to international airports listed in Table AOP-1 of the CAR/SAM ANP).	70% by 2016 80 % by 2017 100% by 2018	18% TMAs with PBN design  (Nr. of TMAs)

<b>B0 - CCO and B0 - CDO: Improve efficiency and flexibility in climb and descent profiles applying continuous climb operations (CCO) and continuous descent operations (CDO) 2017-2019</b>				
<b>ELEMENTS</b>	<b>SCOPE</b>	<b>INDICATORS/ METRICS</b>	<b>GOALS: % / Date</b>	<b>STATUS</b>
3- Applications of CCO and CDO techniques to departures and arrivals  <u>Considered in 2013:</u> 99 international airports <b>Note:</b> The number of international airports considered will be updated in 2016.	All States	Indicator: % of International Airports with arrivals and departures applying CCO and CDO.  Support metrics: Number of International Airports with arrivals and departures applying CCO and CDO.  <b>(Note:</b> this refers to international airports listed in Table AOP-1 of the CAR/SAM ANP).	40 % CCO/CDO by 2018  50% CCO/CDO by 2019	4,52% of International Airports with CCO/CDO implemented.  (Nr. of airports)
	<b>NOTE</b>	Data associated to CDO and CCO implementation metric should be based on information supplied by SAM States. States should undertake a complete assessment of the application of such techniques, based on the guides of ICAO CDO and CCO Manuals to consider airports with CDO and CCO implemented.		
4- PBN routes <b>Note:</b> Analyse implementation of RNP-2 routes (for Continental and Oceanic areas) routes <u>Routes considered in 2015:</u> 165 routes of upper airspace.	All States	Indicator: % of RNP- 2 routes implemented in the upper airspace of the Region.  Support metrics: Number of RNP-2 routes implemented in the upper airspace of the Region.	20 % by 2019*	% RNP 2 routes  (Number of RNP 2 routes in the upper airspace)
	<b>NOTE</b>	*Subject to a feasibility study		
5- Application of the conventional longitudinal separation from 80 to 40 NM	All States	Indicator: % of States applying longitudinal separation of 40 NM at FIR boundaries.  Support metrics: Number of States applying a longitudinal separation of 40 NM at FIR boundaries.	50% by 2016 100% by 2017	XX%  (Nr. of States)

<b>B0 - CCO and B0 - CDO: Improve efficiency and flexibility in climb and descent profiles applying continuous climb operations (CCO) and continuous descent operations (CDO) 2017-2019</b>				
<b>ELEMENTS</b>	<b>SCOPE</b>	<b>INDICATORS/ METRICS</b>	<b>GOALS: % / Date</b>	<b>STATUS</b>
6- Application of the conventional longitudinal separation from 40 to 20 NM	All States	Indicator: % of States applying a longitudinal separation of 20 NM at FIR boundaries.  Support metrics: Number of States that apply a longitudinal separation of 20 NM at FIR boundaries.	2nd Semester 2018	XX %  (Nr. of States)
7. – Optimisation of the longitudinal separation from 20 to 10 NM using ATS surveillance systems	All States	Indicator: % of States applying a longitudinal separation of 10 NM.  Support metrics: Number of States applying a longitudinal separation of 10 NM and number of SAM States with adequate ATS surveillance coverage in FIR boundaries with neighbors States.	100% by 2nd Semester 2019	XX %  (Nr. of States)

<b>B0 - NOPS: Improve traffic flows through the implementation of ATFM 2017-2019</b>				
<b>ELEMENTS</b>	<b>SCOPE</b>	<b>INDICATORS/ METRICS</b>	<b>GOALS: % / Date</b>	<b>STATUS</b>
1- Implementation of regional ATFM	All States	Indicator: % of ACC FMUs/FMPs interconnected in a network  Metrics: Number of ACC FMUs/FMPs interconnected in a network.	50% by 2017 100% by 2018	XX %  (Nr. of FMPs/FMUs)

**AIM AREA**

<b><i>B0 - DATM: Service improvement through digital aeronautical information management 2017-2019</i></b>				
<b>ELEMENTS</b>	<b>SCOPE</b>	<b>INDICATORS/ METRICS</b>	<b>GOALS: % / Date</b>	<b>STATUS</b>
1- AIXM	All States	Indicator: % of States that have implemented AIXM on an AIS database.  Metrics: Number of States that have implemented AIXM on an AIS database.	2016 <b>trials</b> (4 States: ARG, BRA, PAN, URU)  28% by 2017 49% by 2018 100% by 2019	XX% (Nr. of States)
2- Electronic AIP	All States	Indicator: % of States that have implemented an IAID to manage the production of the electronic AIP (eAIP).  Metrics: Number of States that have implemented an IAID to manage the production of the electronic AIP (eAIP).	28% by 2017 56% by 2018 100% by 2019	XX% (Nr. of States)
3- Electronic terrain and obstacle data (e-TOD)	All States	Indicator: % of States that have implemented the Terrain data set.  Metrics: Number of States that have implemented the Terrain data set.  Indicator: % of International Airports by State that have implemented the Obstacle data set.  Metrics: Number of States that have implemented the Obstacle data set.  Indicator: % of International Airports by State that have implemented the data set for Terrain and Obstacles that penetrate the terrain and obstacle data collection surface.  Metrics: Number of International Airports by State that have implemented the data set for Terrain and Obstacles that penetrate the terrain and obstacle data collection Surface.	<b>Area 1:</b> Terrain: 100% by 2016  Obstacles: 28% by 2016 49% by 2017 100% by 2018  <b>Area 2b, 2c and 2d</b>  Terrain: 28 % by 2017 49 % by 2018 100 % by 2019  Obstacles: 28 % by 2017 49 % by 2018 100 % by 2019	<b>Area 1:</b> Terrain: XX% (Nr. of States)  Obstacles: XX% (Nr. of States)  <b>Area 2b, 2c and 2d</b> Terrain: XX% (Nr. of Int. Airports by States)  Obstacles: XX% (Nr. of Int. Airports by States)

<b>B0 - DATM: Service improvement through digital aeronautical information management 2017-2019</b>				
<b>ELEMENTS</b>	<b>SCOPE</b>	<b>INDICATORS/ METRICS</b>	<b>GOALS: % / Date</b>	<b>STATUS</b>
4- Digital NOTAM	All States	Indicator: % of States that have included the digital NOTAM in their National AIS-to-AIM Transition Plan.  Metrics: Number of States that have included the digital NOTAM in their National AIS-to-AIM Transition Plan.	28% by 2017 56% by 2018 100% by 2019	XX% (Nr. of States)
5- Integrated aeronautical information databases (IAID)	All States	Indicator: % of States that have developed integrated aeronautical information databases (IAID).  Metrics: Number of States that have developed integrated aeronautical information databases (IAID).	28% by 2017 56% by 2018 100% by 2019	XX% (Nr. of States)

**CNS AREA**

<b>B0 – FICE: Increased interoperability, efficiency and capacity through ground-ground integration</b>						
<b>ELEMENTS</b>	<b>SCOPE</b>	<b>INDICATORS / METRICS</b>	<b>GOALS: %/ Date</b>			<b>STATUS</b>
			<b>2017</b>	<b>2018</b>	<b>2019</b>	
AMHS implementation/ interconnection	All States	Indicator: % of AMHS systems interconnected  Support metrics: Number of AMHS systems interconnected  <b>13 AMHS systems interconnected by the end of 2019</b>	5	5	3	26 AMHS interconnections will be available by the end of 2016
Implementation of AIDC interconnections between adjacent ACCs	All States	Indicator: % of interconnections implemented between adjacent ACCs  Support metrics: Number of AIDC interconnections implemented between adjacent ACCs  <b>Implementation of 26 AIDCs by the end of 2019</b>	13	6	7	
Implementation of domestic IP networks	All States	Indicator: % of States that have implemented domestic IP networks  Support metrics: Number of domestic IP networks implemented  <b>7 States implemented by the end of 2019</b>	3	2	2	

<i>B0 – SUR: Initial ground surveillance capability</i>						
ELEMENTS	SCOPE	INDICATORS / METRICS	GOALS: %/ Date			STATUS
			2017	2018	2019	
Implementation of ADS B	All States	<p>Indicator: % of ADS B and/or multilateration coverage implemented for higher air navigation levels</p> <p>Goal to 2019: 10% of domestic implementation of ADS-B and/or Multilateration coverage for higher air navigation levels</p>	6%	8%	10%	<p>Current status 5% of ADS B and/or Multilateration coverage</p> <p>ADS B Systems installed in Colombia (13), Guyana (1) and Paraguay (6) Multilateration in Colombia and Ecuador (2)</p>
Surveillance interconnection systems	All States	<p>Indicator: % of coverage of surveillance in flight transferring control area between adjacent AAC of the Region</p> <p>Goal to 2019: 30% of coverage of surveillance in flight transferring control area between adjacent AAC of the Region</p>	10%	20%	30%	<p>5% of surveillance coverage in flight transferring control area between adjacent AAC of the Region</p> <p>There is radar coverage in the radar transferring between AAC Montevideo and AAC Ezeiza</p>
Implementation of the ACC automation system	All States	<p>Indicator: % of ACC automation systems implemented</p> <p>Goal: 100% of ACC automation systems implemented <b>2019</b></p>	95%	100%		90% of automated systems implemented in AAC

<b>B0-SURF: Safety and efficiency of surface operations (A-SMGCS Level 1-2)</b>						
<b>ELEMENTS</b>	<b>SCOPE</b>	<b>INDICATORS / METRICS</b>	<b>GOALS: %/ Date</b>			<b>STATUS</b>
			<b>2017</b>	<b>2018</b>	<b>2019</b>	
A-SMGCS Level 1*		Indicator: % of applicable international aerodromes that have implemented A-SM GCS Level 1  Support metrics: Number of applicable international aerodromes that have implemented A-SMGCS Level 1  <b>4 A-SMGCS Level 1* by the end of 2019</b>		2	2	New implementation
A-SMGCS Level 2*		Indicator: % of applicable international aerodromes that have implemented A-SMGCS Level 2  Support metrics: Number of applicable international aerodromes that have implemented A-SMGCS Level 2  <b>2 A-SMGCS Level 2* by the end of 2019</b>			2	New implementation

<b><i>B0 – TBO: Improved safety and efficiency through the initial application of data link en-route</i></b>						
<b>ELEMENTS</b>	<b>SCOPE</b>	<b>INDICATORS / METRICS</b>	<b>GOALS: %/ Date</b>			<b>STATUS</b>
			<b>2017</b>	<b>2018</b>	<b>2019</b>	
Implementation of ADS C	All States with oceanic FIRS	Indicator: % of oceanic FIRs with ADS C requirement implemented  Goal to 2019: 100% of oceanic FIRs with ADS C implemented	90%	100%		To date 82% ADS C implemented in oceanic FIRS
Implementation of CPDLC	All States	Indicator: % of CPDLC systems implemented in FIRs oceanic and continental areas  Goal to 2019: 100% of CPDLC systems implemented in oceanic FIRs  5% of CPDLC implemented in continental area		2		To date 82% of oceanic FIRs with CPDLC implemented  0% of CPDLC implemented in continental area

**MET AREA**

<b>B0 – AMET: Meteorological information supporting enhanced operational efficiency and safety</b>						
<b>ELEMENTS</b>	<b>SCOPE</b>	<b>INDICATORS / METRICS</b>	<b>GOALS: %/ Date</b>			<b>STATUS</b>
			<b>2017</b>	<b>2018</b>	<b>2019</b>	
MET/QMS in accordance with ISO 9001:2015	All States	Indicator: % of States that have implemented MET QMS (100% by the end of 2019)  Support metrics: Number of States that have implemented MET QMS	70%	86%	100%	All States should update their MET/QMS documentation to align it with ISO 9001. Currently, 7 States have implemented and certified the MET/QMS in their aeronautical meteorological services.
Implementation of SIGMET messages in graphical format	All States	Indicator: % of international aerodromes/MWOs that have implemented graphical procedures.  Support metrics: Number of international aerodromes/MWOs that have implemented graphical SIGMET procedures.	43%	57%	86%	Currently, 3 States have implemented SIGMET messages in graphical format.
Implementation of the IAVW procedure	All States	Indicator: % of international aerodromes/MWOs that have implemented IAVW procedures.  Support metrics: Number of international aerodromes/MWOs that have implemented IAVW procedures	50%	64%	86%	

<b>B0 – AMET: Meteorological information supporting enhanced operational efficiency and safety</b>						
<b>ELEMENTS</b>	<b>SCOPE</b>	<b>INDICATORS / METRICS</b>	<b>GOALS: %/ Date</b>			<b>STATUS</b>
			<b>2017</b>	<b>2018</b>	<b>2019</b>	
Implementation of OPMET messages in XML/GML format	All States	Indicator: % of States that have implemented OPMET messages in XML/GML format.  Support metrics: Number of States that have implemented OPMET messages in XML/GML format.	29%	43%	64%	
Implementation of tropical cyclone watch procedures	States requiring this procedure	Indicator: % of international aerodromes/MWOs that have tropical cyclone watch services  Support metrics: Number of international aerodromes/MWOs that have tropical cyclone watch services	40%	60%	80%	Only Colombia, Guyana, French Guiana, Panama, Suriname, and Venezuela could be affected by tropical cyclones in the SAM Region.
Implementation of surveillance procedures concerning the release of radioactive material	All States	Indicator: Percentage of Meteorological Watch Offices (MWOs) that have implemented surveillance procedures concerning the release of radioactive material  Support metrics: Number of MWOs that have operational cooperation agreements with ACCs for the transmission of reports on the release of radioactive material	14%	29%	50%	<ul style="list-style-type: none"> <li>• Brazil has a domestic contingency plan.</li> <li>• Panama has agreements with the Administration of the Panama Canal regarding transportation of dangerous goods (where radioactive material are included)</li> </ul>
Implementation of wind shear warning and alert procedures	All States	Indicator: Percentage of international aerodromes /AMOs that have implemented wind shear warning and alert procedures  Support metrics: Number of international aerodromes /AMOs that have implemented wind shear warning and alert procedures.	43%	64%	86%	

**AGA AREA**

<b><i>B0 – A-CDM: Optimized airport operations through Airport-CDM</i></b>						
<b>ELEMENTS</b>	<b>SCOPE</b>	<b>INDICATORS / METRICS</b>	<b>GOALS: %</b>			<b>STATUS</b>
			<b>2017</b>	<b>2018</b>	<b>2019</b>	
Standard calculation of airport capacity	All States	<p>Indicator: % of aerodromes registered in the CAR/SAM Air Navigation Plan with movement of more than 7 million passengers per year and with airport capacity (runway/taxiways/ apron) calculated using the same methodology in the region.</p> <p>Support metrics: Number of aerodromes with movement of more than 7 million passengers per year with airport capacity (runway/taxiways/ apron) calculated using the same methodology in the region.</p>	3	7	10	0%
Implementation of A-CDM	All States	<p>Indicator: % of aerodromes registered in the CAR/SAM Air Navigation Plan with movement of more than 7 million passengers per year and that have started A-CDM implementation</p> <p>Support metrics: Number of aerodromes with movement of more than 7 million passengers per year that have implemented A-CDM</p>	3	7	10	1%