International Civil Aviation Organization
South American Regional Office
Second Meeting of Air Navigation and Safety Directors of the SAM Region
(Lima, Peru, 14 to 16 September 2015)

Agenda Item 5: Safety and air navigation implementation priorities 2017 - 2019

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)

ICAO Strategic Objectives:	*A - Safety* *B – Air navigation capacity and efficiency* *E – Environmental protection*

1 Background

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 the 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 under Agenda Item 2.

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. **Appendix A** to this working paper contains a table that reflects the current status of air navigation priorities.

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 In this regard, **Appendix B** to this working paper contains a list of air navigation improvements that should be implemented in the coming years, including those to be accomplished during the period 2014-2016.

2.7 This list responds to global air navigation requirements, ICAO strategic objectives, and the sustainable development objectives established by the United Nations for the next 15 years after 2015.

3 Suggested action

3.1 The Meeting is invited to:

a) take note of the information presented herein;

b) review the list of air navigation improvements shown in section 2 and in Appendix B to this working paper; and

c) agree on the priority to be assigned to each air navigation improvement.

-END-

APPENDIX A

STATUS OF IMPLEMENTATION OF AIR NAVIGATION PRIORITIES FOR THE PERIOD 2014-2016

Indicators		SAM	
		Current value	**Goal by December 2016**
1. TERMINAL PBN	% of APV instrument approach runways with baro-VNAV, in accordance with Resolution A-37/11	66%	100%
2. EN-ROUTE PBN	% of ATS routes with PBN	60%	60%
	% of international aerodromes with PBN SIDs/STARs	64%	60%
3. CDO	% of international aerodromes/TMAs with CDO	4.52%	40%
4. CCO	% of international aerodromes/TMAs with CCO	4.52%	40%
5. Fuel / C02 savings	Reduction of emissions based on IFSET	2014- 51,132t of CO2	Annual reduction of 40,000t of CO2
6. ATFM	% of area control centres (ACCs) providing air traffic flow management (ATFM) services	52%	100%
7. AIM	% of elements required (AIS-to-AIM roadmap) to facilitate AIS-to-AIM transition that have implemented Phase I	84%	100%
8. AMHS interconnection	% of AMHS interconnections at regional level	15%	100%
9. Interconnection of automated systems (ATS interfacility data communication - AIDC)	% of automated system interconnections	13.33%	100%
10. Implementation of domestic IP networks	% of SAM States that have implemented IP communication networks	45%	80%

APPENDIX B

AIR NAVIGATION IMPLEMENTATION PLAN - PERIOD 2017- 2019

ATM AREA

B0 – APTA: Optimisation of approach procedures including vertical guidance 2017-2019				
ELEMENTS	**SCOPE**	**INDICATORS/ METRICS**	**GOALS: %/ Date**	**STATUS**
1-LNAV/ VNAV/RNP-AR	All States	Indicator: % of APV instrument approach thresholds with baro-VNAV (LNAV/VNAV or RNP AR), in accordance with Resolution A-37/11. Support metrics: Number of instrument thresholds where APV instrument approaches with baro-VNAV (LNAV/VNAV or RNP AR) have been implemented, in accordance with Resolution A-37/11. (**Note:** This refers to international airports listed in table AOP-1 of the CAR/SAM ANP).	80% by 2016 100% by 2017 <u>2013 baseline:</u> 175 IFR thresholds	66% of APV IFR thresholds with baro-VNAV (LNAV/VNAV or RNP AR)

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				
ELEMENTS	**SCOPE**	**INDICATORS / METRICS**	**GOALS: %/ Date**	**STATUS**
2- PBN SIDs and PBN STARs	All States	Indicator: % of international airports with PBN SIDs or STARs. Support metrics: Number of international airports that have implemented PBN SIDs or STARs. (**Note:** This refers to international airports listed in table AOP-1 of the CAR/SAM ANP)	80% by 2017 100% by 2018 <u>2014 baseline:</u> 1680 SIDs/STARs at international airports	64 % of international airports with PBN SIDs or STARs implemented
3- Design of TMAs applying PBN	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. (**Note:** This refers to international airports listed in table AOP-1 of the CAR/SAM ANP).	70% by 2016 80 % by 2017 100% by 2018 <u>2015 baseline:</u> 34 TMAs selected	18% TMAs with PBN design
4- Application of CCO and CDO techniques to departures and arrivals	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. (**Note:** This refers to international airports listed in table AOP-1 of the CAR/SAM ANP).	50% CCO/CDO by 2019 <u>2013 baseline:</u> 99 international airports **Note:** Will be updated in 2016.	4.52% of international airports with CCO/CDO implemented

B0 – FRTO: Improve operations through optimised route paths				
ELEMENTS	**SCOPE**	**INDICATORS/ METRICS**	**GOALS: %/ Date**	**STATUS**
5- PBN routes	All States	Indicator: % of PBN routes implemented in the upper airspace of the region. Support metrics: Number of routes implemented in the upper airspace of the region.	80 % by 2017 100% by 2018 <u>2015 baseline:</u> 165 upper airspace routes	60% PBN routes (Corresponds to 99 PBN routes)
6- Reduction of the conventional longitudinal separation from 80 to 40 NM	All States	Indicator: % of States applying a 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 2017 100% by 2018	XX%
7 – Reduction 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.	50% by 2019	XX %
B0 – NOPS: Improve traffic flows through the implementation of ATFM				
ELEMENTS	**SCOPE**	**INDICATORS/ METRICS**	**GOALS: %/ Date**	**STATUS**
8- 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 %

CNS AREA

B0 – FICE: Increased interoperability, efficiency and capacity through ground-ground integration						
ELEMENTS	**SCOPE**	**INDICATORS / METRICS**	**GOALS: %/ Date**			**STATUS**
			2017	***2018***	***2019***	
AMHS implementation/ interconnection	All States	Indicator: % of AMHS systems interconnected Support metrics: Number of AMHS systems interconnected **23 AMHS systems interconnected by the end of 2019**	7	8	8	
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 **Implementation of 18 AIDCs by the end of 2019**	6	6	6	
Implementation of domestic IP networks	All States	Indicator: % of States that have implemented domestic IP networks Support metrics: Number of domestic IP networks implemented **7 States implemented by the end of 2019**	3	2	2	

B0 – SUR: Initial ground surveillance capability						
ELEMENTS	**SCOPE**	**INDICATORS / METRICS**	**GOALS: %/ Date**			**STATUS**
			2017	***2018***	***2019***	
Implementation of ADS B	All States	Indicator: % of ADS B systems implemented Support metrics: Number of ADS B systems implemented **30 ADS B systems implemented by the end of 2019**	5	10	15	New implementation
Implementation of multilateration	All States	Indicator: % of multilateration systems implemented Support metrics: Number of multilateration systems implemented **10 multilateration systems implemented by the end of 2019**	6	2	2	New implementation
Surveillance interconnection systems	All States	Indicator: % of surveillance interconnection systems implemented between adjacent ACCs Support metrics: Number of surveillance interconnection systems implemented **15 surveillance interconnection systems implemented between adjacent ACCs by the end of 2019**	5	5	5	New implementation
Modernisation of the ACC automation system	All States	Indicator: % of new ACC automation systems implemented Support metrics: Number of ACC automation systems implemented **10 new ACC automation systems by the end of 2019**	4	4	2	New implementation

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

B0 – TBO: Improved safety and efficiency through the initial application of data link en-route						
ELEMENTS	**SCOPE**	**INDICATORS / METRICS**	**GOALS: %/ Date**			**STATUS**
			2017	***2018***	***2019***	
Implementation of ADS C	All States	Indicator: % of FIRs that have implemented ADS C Support metrics: Number of ADS C systems implemented **2 ADS C systems implemented by the end of 2019**		2		New implementation
Implementation of CPDLC	All States	Indicator: % of CPDLC systems implemented in FIRs in oceanic and remote continental areas Support metrics: Number of CPDLC systems implemented Oceanic area Remote continental area **2 CPDLC systems implemented in the oceanic area by the end of 2019**		2		New implementation

NAVIGATION INFRASTRUCTURE IN SUPPORT OF ASBU BLOCK B0-APTA

B0 – APTA: Optimisation of approach procedures including vertical guidance B0-CDO Improved flexibility and efficiency in descent profiles (CDO) CCO Improved flexibility and efficiency in climb profiles – Continuous climb operations (CCO)						
ELEMENTS	**SCOPE**	**INDICATORS / METRICS**	**GOALS: %/ Date**			**STATUS**
			2017	***2018***	***2019***	
Increase DME coverage	All States	Indicator: % of new DME systems implemented Support metrics: Number of new DME systems implemented **15 new DME systems implemented by the end of 2019**	5	5	5	New implementation
Activation of VOR systems	All States	Indicator: % of activation Support metrics: Number of VOR systems activated **10% of VOR systems activated by the end of 2019**		5%	5%	New implementation
Implementation of GBAS	All States	Indicator: % of GBAS systems implemented Support metrics: Number of GBAS systems implemented. **Implementation of R GBAS by the end of 2019**	1		2	New implementation

AIM AREA

B0 – DATM: Service improvement through digital aeronautical information management 2017-2019				
ELEMENTS	**SCOPE**	**INDICATORS/ METRICS**	**GOALS: %/ Date**	**STATUS**
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 trials (4 States: ARG, BRA, PAN, URU) 28% by 2017 49% by 2018 100% by 2019	XX% (X 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).	30% by 2017 60% by 2018 100% by 2019	XX% (X 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 States that have implemented the obstacle data set Metrics: Number of States that have implemented the obstacle data set	**Area 1**: Terrain: 100% by 2016 Obstacles: 49% by 2016 51% by 2017	**Area 1**: Terrain: XX% (XX States) Obstacles: XX% (XX States)

B0 – DATM: Service improvement through digital aeronautical information management 2017-2019				
ELEMENTS	**SCOPE**	**INDICATORS/ METRICS**	**GOALS: %/ Date**	**STATUS**
(cont.) 3 – Electronic terrain and obstacle data (e-TOD)	All States	Indicator: % of States that have implemented the data set for terrain and obstacles that penetrate the terrain and obstacle data collection surface. Metrics: Number of States that have implemented the data set for terrain and obstacles that penetrate the terrain and obstacle data collection surface.	**AREA 2b, 2c, and 2d** Terrain: 100% by 2017 Obstacles: 100% by 2017	**AREA 2b, 2c, and 2d** Terrain: XX% (XX States) Obstacles: XX% (XX States)
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% (XX 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% (XX States)

MET AREA

B0 – AMET: Meteorological information supporting enhanced operational efficiency and safety						
ELEMENTS	**SCOPE**	**INDICATORS / METRICS**	**GOALS: %/ Date**			**STATUS**
			2017	***2018***	***2019***	
MET/QMS in accordance with ISO 9001:2015	All States	Indicator: % of States that have implemented MET QMS (100% by the end of 2018) Support metrics: Number of States that have implemented MET QMS	10	12	14	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.	6	8	12	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	7	9	12	
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.	4	6	9	
Implementation of tropical cyclone watch	States requiring this procedure	Indicator: % of international aerodromes/MWOs that have	2	3	4	Only Colombia, Guyana, French Guiana, Panama,

B0 – AMET: Meteorological information supporting enhanced operational efficiency and safety						
ELEMENTS	**SCOPE**	**INDICATORS / METRICS**	**GOALS: %/ Date**			**STATUS**
			2017	***2018***	***2019***	
procedures		tropical cyclone watch services Support metrics: Number of international aerodromes/ MWOs that have tropical cyclone watch services				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	2	4	7	
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.	6	9	12	

AGA AREA

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