International Civil Aviation Organization
South American Regional Office
Meeting on GREPECAS MET Programme Projects

(Lima, Peru, from 18 to 22 September 2017)

SAM/MP2-WP/14
13/09/17

Agenda Item 6: Emerging aspects of implementation

Electronic Air Navigation Plan (e-ANP) for the CAR/SAM Regions

(Presented by the Secretariat)

SUMMARY

The purpose of this working paper is to inform States and MET community about the progress of the electronic Air Navigation Plan (e-ANP) for the CAR/SAM Regions, especially about the MET part.

REFERENCES:

- Twelfth Air Navigation Conference (AN-Conf/12)
- e-ANP WG meetings
- CAD Directors and Implementation Groups meetings
- GREPECAS/17
- PPRC/3
- NAM/CAR Regional Performance-Based Air Navigation Implementation Plan (RPBANIP)
- Performance-based Implementation Plan for the SAM Region (SAM-PBIP)

ICAO Strategic Objectives:	*A - Safety* *B - Air navigation capacity and efficiency*

1. Introduction

1.1 The Twelfth Air Navigation Conference (AN-Conf/12) agreed to Recommendation 6/1- *Regional performance framework – planning methodologies and tools regarding the alignment of regional ANPs with the fourth edition of the Global Air Navigation Plan (GANP) (Doc 9750).*

1.2 Following this recommendation, ICAO established a working group (e-ANP WG), composed of representatives from Regional Offices and ICAO Headquarters, to make proposals for changes to the regional ANPs which included the development of a new structure, format and content of the ANP.

1.3 During GREPECAS/17 Meeting, States also noted the revised procedure for amendment of the e-ANP, using a web-based platform. Current procedures for amendment of the Basic ANP and of the FASID, with minor changes, would be applicable to new Volumes I and II. The management and amendment of Parts 0 and I of Volume III should go through a Secretariat inter-regional coordination mechanism, and Part II would require approval under the responsibility of the relevant PIRG, which for CAR/SAM Regions, is GREPECAS.

1.4 The implementation of e-ANP was also reported to Civil Aviation Directors (CADs) during the different meetings held in the CAR and SAM Regions, as well as through the regional implementation groups (SAM/IG and ANI/WG), which have expressed their support to the development. In order to expedite development processes and data incorporation in both Regions, focal points were designated for each administration, which will facilitate as well corresponding approval and application.

1.5 PPRC/3 Meeting took note of the progress in the implementation of the new Electronic Air Navigation Plan (e-ANP) for the CAR/SAM Regions, which consists of three volumes:

- Volume I which should include steady elements of the plan, and requires the Council approval;

- Volume II which should include dynamic elements of the plan, and does not require the Council approval (approval is by regional agreement of the corresponding PIRGs);

- Volume III which should include dynamic/flexible elements of the plan, providing guidance for the planning of the implementation of air navigation systems and their modernization, taking into account emerging programmes, as ASBU, and roadmaps of associated technologies described in the GANP.

2. **Discussion**

2.1 NACC and SAM Regional Offices, in line with global planning for the implementation of eANP followed by the other ICAO Regions, established compliance targets for the development of the regional electronic Air Navigation Plan in order to complete new formats with the incorporation of available information to be validated through specialized regional meetings or other coordination mechanisms.

2.2 Likewise, Officers designated by both Regional Offices as part of the e-ANP working group (e-ANP WG), were responsible for introducing in the electronic templates prepared by Headquarters and presented to GREPECAS/17, the relevant information concerning Volumes I and II of both regions.

2.3 The Meeting shall recall that PPRC/3, following compliance goals for the preparation of the CAR/SAM e-ANP, agreed to approve its revision in two phases.

2.4 Considering the above, PPRC/3 formulated Decision 3/2 – **Approval of New CAR/SAM Regions electronic Air Navigation Plan (e-ANP) Volumes I, II and III**, which reads:

> That, in order to expedite the preparation and approval of the new electronic Air Navigation Plan (e-ANP) for the CAR/SAM Regions, the NACC and SAM Regional Offices, using the GREPECAS fast-track procedure:
>
> a) circulate by **15 August 2015**, Volumes I and II of the new e-ANP for CAR/SAM States approval; and
>
> b) circulate by **15 October 2015**, Volume III of the new e-ANP for CAR/SAM States approval.

2.4.1 Regional Offices and the Secretariat took the following actions tending to expedite the approval of Volumes I, II and II:

2.4.2 **e-ANP Volume I**

a) On 26 August 2015, the Secretariat circulated letter LT 1/4.2.4-SA468 requesting States to consider the approval of the content of Volumes I, II and III of eANP CAR/SAM.

b) In reply to the referred letter, States submitted comments and new data, making it necessary to modify the content of the referred volumes.

c) A draft Proposal for Amendment (PFA) to Vol I of CAR/SAM e-ANP was sent to D/ANB requesting comments for 10 November 2015. D/ANB's remarks and comments were included in the PFA and, with this new content, the Secretariat circulated letter LT 2/7.2.135-SA656 on 7 December 2015, requesting States a new review of Volume I of CAR/SAM e-ANP.

d) The reviews and comments of the States resulted in a second consultation, in view of the introduction of new data, the modification of the AOP Table and related tables. This second consultation was initiated by the Secretariat with letter LT 2/7.2.135-SA044 on 4 February 2016.

e) Once completed the consultation period, Proposal for Amendment to Volume I of CAR/SAM e-ANP was submitted to ICAO Council consideration on 22 March 2016.

f) Amendment to Volume I of CAR/SAM e-ANP was approved by ICAO Council on 4 April 2016.

g) Such approval was communicated to States on 5 April 2016.

2.4.3 **e-ANP Volume II**

a) Taking into consideration paragraphs a) and b) related to Volume I, the content of Volume II is modified as a result of the changes introduced in this first consultation.

b) With the changes introduced, as a result of the modification of Volume I and new data provided by the States, a Proposal for Amendment to Volume II of CAR/SAM e-ANP was prepared, which was submitted to D/ANB for consideration and comments, on 17 March 2016.

c) In addition, on 10 May 2016, the Secretariat submitted for States consideration letter LT 2/7.3.29-SA195 with a proposal for amendment to the CAR/SAM Air Navigation Plan, Volume II, Part IV ATM – ATS Routes (Doc 8733), serial N° CARSAM 16/01-ATM, originated by Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Guyana, Panama, Paraguay, Peru, Suriname, Uruguay, Venezuela and IATA.

d) On 17 May 2016, the Secretariat, through State Letter NACC60664, submitted for consideration Proposal for Amendment to Volume II of CAR/SAM e-ANP.

2.4.4 **e-ANP Volume III**

a) Even though a draft version has been prepared since October 2015, it is subject to be completed considering the general and specific requirements included in Vol. II.

b) The content of Vol. III has been formulated taking into account the regional plans RPBANIP and SAM-PBIP aligned to ASBU methodology improvements.

c) Simultaneously, Air Navigation Reports Formats (ANRF) have been prepared for the CAR and SAM Regions in accordance with the format approved by ICAO Council, and the need to standardize the referred formats through teleconferences between Regional Offices and HQ was discussed, in order to prepare the final version.

d) In addition, HQ has started to work in the new version of the GANP 2019, therefore, D/ANB suggested aligning Volume III of e-ANP with these changes.

e) The Meeting shall be aware of the challenge that implies the development of Volume III and the complications that difficult its approval before the end of 2016.

2.5 **Part MET of e-ANP**

2.5.1 The e-ANP contains three volumes. The meteorological services included in the e-ANP volumes are:

- Vol. I
  a) Part V – Meteorology (MET)
  b) Table I-1 – State Volcano Observatory.

- Vol. II
  a) Part V – Meteorology
  b) Table II-1 – Meteorological Watch Offices
  c) Table II-2 – Aerodrome Meteorological Offices.
  d) Table II-3 – Volmet Broadcasts.

- Vol. III.
  This part of the e-ANP includes dynamic and flexible elements of the Plan. It should describe the ANRF and the ASBU implementation assessment and control procedures. Part MET should describe implementation procedures, planning and metrics to be considered to assess B0-AMET implementation.

3. **Conclusion**

3.1 The approval processes of Vols. I and II have experienced delays due to the constant update by States.

3.2 It will be important that MET professionals get involved with Part MET, which includes the three e-ANP volumes, in order to take into account the continuous revisions. In addition, MET professional should contact States' e-ANP focal points to review the documents and, if necessary, propose an amendment.

3.3 The work carried out by the Regional Offices for Volume III will require normalizing criteria, working with standardized formats and consider its alignment with the changes that would be introduced in the GANP 2019.

3.4 MET professionals should review B0-MET elements in their States using the Air Navigation Report Formats (ANRF) in order to advance with the information to be reported for e-ANP Vol. III. Delegates attending this Meeting could provide the information regarding their States to complete the corresponding documentation**. Appendix A** to this working paper presents examples of the referred documents.

3.5 With the approval of Volumes I and II of the eANP, which replace Doc. 8733, the field of references in Air Navigation deficiencies should be reviewed and updated.

4. **Suggested action**

4.1 Based on the above, the Meeting is invited to:

a) review the information presented in this working paper; and

b) take other actions that may be considered necessary to provide the information that should be included in Volume III of e-ANP CAR/SAM.

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Appendix A

TABLE GEN III-1 – IMPLEMENTATION INDICATOR(S) FOR EACH ASBU BLOCK 0 MODULE

Explanation of the Table

1 Block 0 Module Code
2 Block 0 Module Title
3 High level Implementation Indicator
4 Remarks

Module Code	Module Title	Implementation Indicator	Remarks
1	2	3	4
B0-APTA	Optimization of Approach Procedures including vertical guidance	% of international aerodromes having at least one runway end provided with APV Baro-VNAV or LPV procedures	
B0-WAKE	Increased Runway Throughput through Optimized Wake Turbulence Separation	% of applicable international aerodromes having implemented increased runway throughput through optimized wake turbulence separation	1. Not to be considered for the first reporting cycles due to lack of maturity. 2. List of ADs to be established through regional air navigation agreement.
B0-RSEQ	Improve Traffic flow through Runway Sequencing (AMAN/DMAN)	% of applicable international aerodromes having implemented AMAN / DMAN	1. Not to be considered for the first reporting cycles due to lack of maturity. 2. List of ADs to be established through regional air navigation agreement.
B0-SURF	Safety and Efficiency of Surface Operations (A-SMGCS Level 1-2)	% of applicable international aerodromes having implemented A-SMGCS Level 2	List of ADs to be established through regional air navigation agreement.
B0-ACDM	Improved Airport Operations through Airport-CDM	% of applicable international aerodromes having implemented improved airport operations through airport-CDM	List of ADs to be established through regional air navigation agreement.
B0-FICE	Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration	% of FIRs within which all applicable ACCs have implemented at least one interface to use AIDC / OLDI with neighbouring ACCs	
B0-DATM	Service Improvement through Digital Aeronautical Information Management	- % of States having implemented an AIXM based AIS database - % of States having implemented QMS	

Module Code	Module Title	Implementation Indicator	Remarks
1	2	3	4
B0-AMET	Meteorological information supporting enhanced operational efficiency and safety	- % of States having implemented SADIS / WIFS - % of States having implemented QMS	
B0-FRTO	Improved Operations through Enhanced En-Route Trajectories	% of FIRs in which FUA is implemented	
B0-NOPS	Improved Flow Performance through Planning based on a Network-Wide view	% of FIRs within which all ACCs utilize ATFM systems	
B0-ASUR	Initial capability for ground surveillance	% of FIRs where ADS-B OUT and/or MLAT are implemented for the provision of surveillance services in identified areas.	1. Not to be considered for the first reporting cycles due to lack of maturity.
B0-ASEP	Air Traffic Situational Awareness (ATSA)	% of States having implemented air traffic situational awareness	1. Not to be considered for the first reporting cycles due to lack of maturity.
B0-OPFL	Improved access to optimum flight levels through climb/descent procedures using ADS-B	% of FIRs having implemented in-trail procedures	1. Not to be considered for the first reporting cycles due to lack of maturity.
B0-ACAS	ACAS Improvements	% of States requiring carriage of ACAS (with TCAS 7.1 evolution)	
B0-SNET	Increased Effectiveness of Ground-Based Safety Nets	% of States having implemented ground-based safety-nets (STCA, APW, MSAW, etc.)	
B0-CDO	Improved Flexibility and Efficiency in Descent Profiles (CDO)	- % of international aerodromes / TMAs with PBN STAR implemented - % of international aerodromes/TMA where CDO is implemented	
B0-TBO	Improved Safety and Efficiency through the initial application of Data Link En-Route	% of FIRs utilising data link en-route in applicable airspace	
B0-CCO	Improved Flexibility and Efficiency Departure Profiles - Continuous Climb Operations (CCO)	- % of international aerodromes / TMAs with PBN SID implemented - % of international aerodromes/TMA where CCO is implemented	

Appendix A

SAMPLE TEMPLATE

1. AIR NAVIGATION REPORT FORM (ANRF)

(This template demonstrates how ANRF to be used.
The data inserted here refers to ASBU B0-05/CDO as an example only)

Regional and National planning for ASBU Modules

2. REGIONAL/NATIONAL PERFORMANCE OBJECTIVE – B0-05/CDO: Improved Flexibility and Efficiency in Descent Profiles

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	Y	Y

4. ASBU B0-05/CDO: Planning Targets and Implementation Progress

5. Elements	6. Targets and implementation progress (Ground and Air)
1. CDO	
2. PBN STARs	

7. ASBU B0-05/CDO: Implementation Challenges

Elements	Implementation Area			
	Ground system Implementation	Avionics Implementation	Procedures Availability	Operational Approvals
1. CDO				
2. PBN STARs				

8. Performance Monitoring and Measurement 8A. ASBU B0-05/CDO: Implementation Monitoring	
Elements	**Performance Indicators/Supporting Metrics**
1. CDO	Indicator: Percentage of international aerodromes/TMAs with CDO implemented Supporting metric: Number of international aerodromes/TMAs with CDO implemented
2. PBN STARs	Indicator: Percentage of international aerodromes/TMAs with PBN STARs implemented Supporting metric: Number of international aerodromes/TMAs with PBN STARs implemented

8. Performance Monitoring and Measurement 8 B. ASBU B0-05/CDO: Performance Monitoring	
Key Performance Areas (Out of eleven KPAs, for the present until experienced gained, only five have been selected for reporting through ANRF)	**Where applicable, indicate qualitative Benefits,**
Access & Equity	Not applicable
Capacity	Not applicable
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
Safety	More consistent flight paths and stabilized approach paths. Reduction in the incidence of controlled flight into terrain (CFIT).
9. Identification of performance metrics: It is not necessary that every module contributes to all of the five KPAs. Consequently, a limited number of metrics per type of KPA, serving as an example to measure the module(s)' implementation benefits, without trying to apportion these benefits between module, have been identified on page 5. For the family of ASBU modules selected for air navigation implementation, States/Region to choose the applicable performance (benefit) metrics from the list available on page 5. This approach would facilitate States in collecting data for the chosen performance metrics. States/Region, however, could add new metrics for different KPAs based on maturity of the system and ability to collect relevant data.	

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

Description and purpose

Global, regional and local meteorological information:

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

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

Main performance impact:

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

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

B0 – AMET: Meteorological information supporting enhanced operational efficiency and safety			
Elements	***Applicability***	***Performance Indicators/Supporting Metrics***	***Targets***
SADIS 2G and Secure SADIS FTP	*All States*	Indicator: % of States having implemented SADIS 2G satellite broadcast or Secure SADIS FTP service Supporting metric: number of States having implemented SADIS 2G satellite broadcast or Secure SADIS FTP service	90% by Dec. 2015 100% by Dec. 2017
QMS	*All States*	Indicator: % of States having implemented QMS for MET Supporting metric: number of States having implemented QMS for MET	60% by Dec. 2015 80% by Dec. 2017

Table B0-AMET 3-1

SADIS 2G and Secure SADIS FTP

EXPLANATION OF THE TABLE

Column

1 Name of the State
2, 3 Status of implementation of SADIS 2G and/or Secure SADIS FTP, where: Y – Yes, implemented
N – No, not implemented

State	Implementation	
	SADIS 2G	Secure SADIS FTP
1	2	3

Table B0-AMET 3-2

Volcanic Ash Advisory Centers

EXPLANATION OF THE TABLE

Column

1 Name of the State responsible for the provision of a volcanic ash advisory centre (VAAC)

2 Name of the VAAC

Note: The name is extracted from the ICAO Location Indicators (Doc 7910).

3 ICAO location indicator of the VAAC

4 Status of implementation of volcanic ash advisory information, where: FC – Fully compliant
PC – Partially compliant
NC – Not compliant

5 Status of implementation of volcanic ash advisory information in graphical format, where: FC – Fully compliant
PC – Partially compliant
NC – Not compliant

State	Volcanic Ash Advisory Centre (VAAC)	ICAO Location Indicator	Status of Implementation	
			VAA	VAG
1	2	3	4	5
			FC	FC

Table B0-AMET 3-3

Tropical Cyclone Advisory Centers

EXPLANATION OF THE TABLE

Column

1 Name of the State responsible for the provision of a tropical cyclone advisory centre (TCAC)

2 Name of the TCAC

Note: The name is extracted from the ICAO Location Indicators (Doc 7910).

3 ICAO location indicator of the TCAC

4 Status of implementation of tropical cyclone advisory information, where:

FC – Fully compliant
PC – Partially compliant
NC – Not compliant

5 Status of implementation of tropical cyclone advisory information in graphical format, where:

FC – Fully compliant
PC – Partially compliant
NC – Not compliant

State	Tropical Cyclone Advisory Centre (TCAC)	ICAO Location Indicator	Status of Implementation	
			TCA	TCG
1	2	3	4	5
			FC	FC

Table B0-AMET 3-4

Quality Management System

EXPLANATION OF THE TABLE

Column

1 Name of the State

2, 3, 4, 5 Status of implementation of Quality Management System of meteorological information – QMS: not started/ planning, ongoing/ partially implemented, Implemented/ISO 9001 Certified, Date of Certification.

6 Action Plan

7 Remarks

State	Not started/ planning	Ongoing/ partially implemented	Implemented/ ISO 9001 Certified		Action	Parks
			Status	Date of Certification		