International Civil Aviation Organization
CAR/SAM Regional Planning and Implementation Group (GREPECAS)
Seventeenth Meeting of the CAR/SAM Regional Planning and Implementation Group (GREPECAS/17)
(Cochabamba, Bolivia (Plurinational State of), 21 to 25 July 2014)

Agenda Item 3: Air navigation activities at global, intra-regional and inter-regional level

3.3 Inter-regional air navigation activities

Inter-regional activities between the CAR and SAM Regions and between CAR and SAM and other ICAO Regions

(Presented by the Secretariat)

SUMMARY	
This working paper presents an overview on the inter-regional activities between the CAR and SAM Regions and between CAR and SAM and other ICAO regions, for air navigation services harmonization.	
ICAO Strategic Objectives:	*A - Safety* *B - Air navigation capacity and efficiency* *E - Environmental protection*

1. Introduction

1.1. In this working paper, a description is made on the inter-regional activities between CAR and SAM Regions and between CAR and SAM and other ICAO regions. CAR/SAM inter-regional activities coordinated between NACC and SAM Regional Offices, as detailed in **Appendix A** to this working paper, are the following:

- Seventeenth Meeting on the improvement of air traffic services over the South Atlantic (SAT/17 - Las Palmas, Spain, 18 to 20 April, 2012);
- ICAO/WMO CAR/SAM Seminar/Workshop on MET requirements in support of ATM (Mexico City, Mexico, 22 to 24 October, 2012);
- ICAO Seminar on Volcanic Ash Products and Communications for the NAM/CAR and SAM Regions (Mexico City, Mexico, 24 to 26 October, 2012);
- PBN Airspace Planning Concept Workshop (Miami, USA, 11 to 22 March, 2013);
- Eighteenth Meeting on the improvement of air traffic services over the South Atlantic (SAT/18 - Dakar, Senegal, 17 to 19 July, 2013);

- ICAO NAM/CAR and SAM Search and Rescue (SAR) and Civil/Military Coordination Seminar (Mexico City, Mexico, 26 to 30 May, 2014).

2. **Discussion**

2.1. In view of the development of emerging technologies and avionics capacities on board of aircraft, discussions of States on operational improvements have focused on international civil aviation community expectations to harmonize air navigation services.

2.2. During the different inter-regional events, it was agreed to maintain a harmonized implementation of operational improvements. Such requirements, as defined on the performance plans and ASBU, aim to satisfy expectations of users.

2.3. On the other hand, States have recognized the need to apply ICAO provisions to comply with the implementation requirements according to the different air navigation plans.

2.4. It is to be noted that ICAO is working on additional guidance texts and the required assistance by States, to ensure a common understanding between the different regions for a global harmonization of air navigation applications and the establishment of performance-based air navigation plans, in benefit of the entire world aviation community.

3. **Suggested actions**:

3.1 The Meeting is invited to:

a) Note the information presented;

b) analyse the information on the inter-regional CAR and SAM activities, in order to facilitate the harmonization of regional and global air navigation services; and

c) recommend actions as deemed necessary by the meeting.

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APPENDIX A

INTER-REGIONAL ACTIVITIES BETWEEN THE CAR AND SAM REGIONS AND BETWEEN CAR AND SAM AND OTHER ICAO REGIONS

1. Seventeenth and Eighteenth Meeting on the improvement of air traffic services over the South Atlantic (SAT/17 and SAT/18)

1.1 The SAT/17 Meeting (Las Palmas, Spain, 18 to 20 April 2012), was attended by 46 experts from 9 States and 4 industry representatives. The SAT/18 Meeting (Dakar, Senegal, 17 to 19 July 2013), was attended by 64 experts from 12 States and 6 industry representatives.

2. SATMA report on Traffic Statistics, Safety procedures and Operational procedures in the EUR/SAM corridor

Traffic Statistics in the EUR/SAM corridor

2.1 In the global and detailed information about the air traffic statistics of the EUR-SAM Corridor during year 2012 as well as the evolution of these figures since 2004, it was noted that during 2009, the global figures of the EUR-SAM corridor showed a relevant drop of -16%. Likewise, for the last two years, an important increase was experimented: 2% and 11% respectively for 2010 and 2011. However, the upward trend has not been consolidated in 2012, showing a decrease of 2% year-on-year average. Globally, the corridor is at similar level than during 2007 or inclusive 2011 with the same average traffic per day.

2.2 ***EUR/SAM Corridor Traffic Risk Assessment*** SATMA has been performing the required periodical Risk Assessment for the region since RVSM/RNP10 was implemented in the EUR/SAM corridor in January 2002 and that the CRM model approved by ICAO to perform Safety Assessment in RVSM areas is strongly based on Traffic Data and on LHD deviations. So, it is important that this basic Data Set, regarding Deviations and Traffic, is reported properly and on time as a requirement to perform the Risk Assessment.

2.3 In this regard, SATMA reported once more that it was not receiving the required monthly data from concerned ACCs. Moreover, in the data provided sometimes there is not information of all the needed waypoints and, in some other cases, the information is incoherent. As a result, trajectories and information at required waypoints (i.e., time and FL) have to be assumed, considering the most logical routes and speeds for the extrapolation.

LHD Monitoring in the EUR/SAM Corridor

2.4 SATMA presented to the meeting, the evolution of the LHDs reported to it for year 2012. During this period, 60 LHD reports were delivered to SATMA by the focal points of the EUR-SAM Corridor ACC´s (60 reports).

2.5 The most common reason of the LHD, 58 reports, is still the same than on previous SATMA reports: "operational coordination error between adjacent ACC´s". The causes of these operational errors are as follows:

- Entry into airspace at incorrect flight level: 30 reports;
- Entry into airspace at incorrect estimate and Flight Level: 01 report;
- No revision of the ETO over the boundary point by the transferring ACC: 14 reports;
- Total lack of data (traffic without estimate over the boundary): 11 reports;
- Entry into airspace at different coordinated COP: 02 reports;
- Flight crew climbed without ATC Clearance: 01 report;
- Technical issues: 01 report.

2.6 The number of the LHD reported for this period, a total of 60 LHD´s received, shows an important decrease compared with the number of LHD received by SATMA and discussed on past SAT Meetings, (124 on SAT/16 and 206 on SAT/17). This fact does not necessarily mean that the number of operational errors is decreasing.

Operational Status of the AORRA Area

2.7 The SAT/18 meeting took with great interest, cognition of the content of an information paper presented by IATA commending the collaboration and cooperation of all stakeholders involved in the AORRA project as a model for all global ATM environments to follow. The paper reported also that more than 40 stakeholders, including Air Navigation Service Providers, IATA, ICAO, CANSO, ASECNA, Delta Air Lines and Emirates Airline worked together since 2009 to introduce today's dynamic routes concept. So, establishing the AORRA airspace for crossing the South Atlantic Oceanic airspace, in conjunction with the iFLEX project, has resulted in operational benefits that see time, fuel and CO_2 savings, as well as safety enhancements. It has also developed the concept of air traffic management (ATM) looking at strategic objectives to help reduce emissions and enhance flight efficiency and safety.

Implementation of Additional Exit/Entry Waypoints to increase Flexibility in the AORRA Airspace in the North Atlantic Airspace

2.8 While considering a request emanating from IATA, the meeting was reminded of the successful implementation on 21st December 2006 of the Atlantic Ocean Random Routing RNAV Area (AORRA) and the concept of filing and flying 'User-preferred Trajectories' in remote and oceanic airspaces, supported by the availability of relevant volumes of 'random-route' airspaces.

2.9 Initially, a limited number of existing waypoints were used for entry and exit to/from the AORRA. Additional points were later added on to provide more flexibility and increase the number of transitions to/from continental airspace. The last improvement was in 2012, where the AORRA airspace moved from 0° to 4°N. IATA proposed additional entry/exit waypoints in order to provide operators from North America to West Africa and vice-versa with more flexibility towards a common goal of building seamless flight trajectories that are optimized for upper wind patterns and significant weather avoidance.

2.10 Based on feedback from the airlines indicating that computerized flight planning and dispatch systems may determine minimum cost routes to UK and Northern Europe flying from South America, IATA proposed the creation of three additional waypoints on the west side of the EUR/SAM corridor in order to provide operators suitable flight planning options between the SAM and Northern Europe. The introduction of these three new waypoints will result in the following benefits:

- Reduction of carbon footprint due to CO_2 emissions.
- Reduced flight times due to optimized trajectories.
- Decreased fuel consumption.
- Additional capacity to the EUR/SAM corridor.
- Increased flight planning options and severe weather avoidance

Ascension Island FHAW/ASI and its criticality to airline operations

2.11 The SAT/18 meeting was seized with a paper presented by IATA on the use of Ascension Island as an En-route alternate in accordance with regulatory requirements. The paper demonstrated the importance of Ascension Island for flights operating across the South Atlantic between Africa and South America, with regard to the nomination of an En-route alternate.

2.12 It was highlighted that operators are facing the following main challenges when selecting suitable En-route alternates, in particular concerning the Ascension Island:

- *Validity of TAF:* Flights legs across the South Atlantic can be up to 15 hours. With Flight Plans produced by dispatchers as much as 4 hours before departure times, TAF with validity of only 24 hours can be a challenge for operators. Airlines can only nominate an airport as suitable to use for an operation if there is a valid TAF. It is therefore essential that TAF validity is not left to expire and that the validity is far enough in to the future to allow for ultra-long-haul planning. Amendment 74 to ICAO Annex 3 contains provisions for MET authorities to issue TAFs with a validity of up to 30 hours to meet the flight planning needs of ultra-long-haul flights.

- *Access / availability of valid airport data:* In order to carry out safe operations at any airport the most up to date information concerning the airport must be readily available to all stakeholders. Access to this information is sometimes limited at military airports. For example, NOTAMs may give reference to the DoD website that certain stakeholders are unauthorized to access.

Co-ordination failures in the SAT Region

2.13 Based on statistics gathered by ARMA (AFI RSVM Monitoring Agency), South Africa reported to the Sat/18 meeting on the issue of continued and increasing occurrences of coordination failures associated with the AFI region that are creating serious risks to aviation and RVSM safety**.**

2.14 In the analysis made by ARMA the following co-ordination failures have been identified:

- Incorrect estimates passed for reporting points resulting in aircraft arriving early or later than anticipated at the reporting point seriously affecting standard separation.

- No estimates passed at all with aircraft reporting on frequency uncoordinated.

- Incorrect FLAS both coordinated and uncoordinated.

- Incorrect flight levels coordinated with aircraft reporting at a waypoint at another level.

2.15 The SAT/18 meeting noted with concern that the number of occurrences in the SAT area for the period of January to June 2013, is as high as 56, divided as follows:

- FAJO/FNLU: 36
- FAJO/SAEZ: 17

2.16 While recognizing that ARMA/TAG are processing all coordination failure events and dispatching to States/ACC's for remedial action, the meeting called upon the SAT States to be vigilant about this kind of events and to take remedial actions to address the associated risk.

3. ICAO/WMO CAR/SAM Seminar/Workshop on MET requirements in support of ATM

(Mexico D.F., Mexico, 22 to 24 October 2012)

3.1 25 participants, from 13 States, attended the ICAO/WMO CAR/SAM Seminar/Workshop on MET requirements in support of ATM. The purpose of the seminar and results were the following:

- Discuss the MET component of the global ATM operational concept.
- Enhance MET support to ATM in a global perspective.

3.2 The following information on the following issues was provided during the Seminar/Workshop:

- What is the ATM and Evolution of ICAO requirements;
- Air traffic and meteorological services organizations:
- Reduced vertical separation minima (RVSM);
- New meteorological services in support to the ATM system.

4. ICAO Seminar on Volcanic Ash Products and Communications for the NAM/CAR and SAM Regions

(México D.F., Mexico, 24 to 26 October 2012)

4.1 The ICAO Seminar on Volcanic Ash Products and Communications for the NAM/CAR and SAM Regions, was attended by 27 participants from 15 States. The purpose of the seminar and results were the following:

- Provide volcanic ash coordination procedures;
- Provide tropical cyclone coordination procedures, Annex 3;
- Inform States on the documentation available regarding International Airways Volcano Watch (IAVW), volcano observatories, role of ICAO IAVW Operations Group.

4.2 The following information was provided during the Seminar/Workshop:

- Regional CAR/SAM ATM Volcanic Ash Contingency Procedures available in ICAO web page (http://www.icao.int/NACC/Pages/edocs-atm.aspx);
- Coordination between Aeronautical Information Services and Aeronautical Meteorological Services;
- Information on Perspective Future Functions of the WAFS;
- ICAO International Airways Volcano Watch (IAVW);
- IAVW Operations Group (IAVWOPSG);
- Volcanic Ash Products;
- Volcanic Ash Guidance Material, Manual on Volcanic Ash, Radioactive Material and Toxic Chemical Clouds (Doc 9691) and Handbook on the IAVW (Doc 9766);
- The role of volcano observatories;
- SIGMET

4.3 In view of some concerns expressed by the participants regarding problems faced due to contamination of runways with volcanic ash, it was emphasized the importance of the coordination in this situation, not only with ATM units and NOF, but also with the aerodromes area (AGA).

5. PBN Airspace Planning Concept Course/Workshop
(Miami, United States, 11 to 22 March 2013)

5.1 The objective of this Course/Workshop was to train CAR/SAM Region experts to address the design phase of Terminal Area airspaces design under the PBN concept.

5.2 Prior to the beginning, and at workshop organizers' requirement, participants had to approve on-line courses on PBN training package and airspace design. Both on-line courses on PBN: *PBN Overview* and *PBN Airspace* are available at www.icao.int/pbn, *Web-based training* webpage, including *ilearn* package.

5.3 The workshop provided participants with a better understanding on ICAO PBN Manual and CCO/CDO operations. Examples and experiences in complex Terminal Areas of other States were also highlighted.

5.4 The Course/Workshop improved participant's knowledge on airspace design, taking into consideration the PBN concept. Selected practical exercises were very suitable for their various features, considering both, en-route and TMA operations.

5.5 ATM/COM/NAV/SUR capacities of States (Peru and Mexico) were considered, as well as the analysis of traffic volume, fleet mix, equipment and traffic flows to solve real operational problems in a selected airspace. Opportunity was given to observe an example of an accelerated simulation demonstration after optimization of major air traffic flow on a gate-to-gate concept.

5.6 States' participants had the opportunity to know and learn to develop a project with clear dates and milestones to incorporate the new airspace structure, and were duly qualified as experts to provide training in airspace design in their States and CAR/SAM Regions.

5.7 The Workshop was attended by 44 participants from 8 NAM/CAR and SAM States and 3 international organizations. The outcome of the Workshop is as follows:

- For early implementation of a PBN airspace concept, States should promote airspace redesign with Area Navigation/Required Navigation Performance RNAV/RNP navigation specifications in accordance with ICAO provisions;

- States should promote collaborative efforts to establish national PBN airspace design teams;

- PBN airspace redesign and implementation should take into account:

  - traffic complexity and consider air traffic density and ATC workload;

  - redesign ATS airspace sectors should be through the implementation of direct routes between city pairs based on the gate-to-gate concept;

  - interface standard instrument departure SID and standard instrument arrival STAR of the terminal control areas TMAs, to/from specific departure and arrival sectors in the upper/lower RNAV route network;

  - implement SID and STAR based on Continuous descent operations (CDO) and Continuous Climb Operations (CCO) criteria, as required;

  - publication of RNP approach procedures in accordance with ICAO Assembly Resolution A37-11;

- States should ensure high quality of aeronautical information and data associated to the publication of PBN aeronautical charts;

- States to ensure that principles of access and equity are included in all airspace modernization and redesign efforts and detail how they will monitor the service providers to ensure that they are providing fair, equitable and efficient access to all aviation services including general aviation;

- States should promote emerging ATC procedures, methodologies and training programmes for all staff concerned (civil aviation authorities (CAA), ATS, airlines, etc.);

- States should revise restricted areas based on the Flexible Use of Airspace (FUA) in order to improve safety, efficiency and airspace capacity for aircraft operations according to necessities of the civil and military users; and

- States should promote implementation of PBN operational approval processes and recognize other State's PBN operational approval as described in the ICAO Doc 9613, *Performance-based Navigation (PBN) Manual.*

5.8 In addition, a Regional PBN Operational Approval (*Train the Trainer*) Course was conducted with the purpose of providing experienced CAA's personnel with a comprehensive understanding of the requirements for PBN operational approval, in order for them to be able within a year to run an equivalent course for inspectors and flight operations regulatory staff in their State/Territory.

5.9 All States will submit benefits accomplished in reducing CO_2 emissions with PBN implementation by using the online ICAO Fuel Savings Estimation Tool (IFSET). The estimation of indicators should be based on operational improvements obtained in the ATM operational efficiency, and the use of infrastructure and alternative fuels. States will continue working in close coordination with the ICAO NACC Regional Office to monitor implementation progress.

6. ICAO NAM/CAR and SAM Search and Rescue (SAR) and Civil/Military Coordination Seminar - Special Implementation Project (SIP)

(Mexico City, Mexico, 26 to 30 May 2014)

6.1 As follow-up to AN-Conf/12 Recommendation 4/5 – "*civil/military coordination/ cooperation and sharing of airspace*", this Seminar was conducted at NACC Office premises, under the frame of SIPNACC-SAR Special Implementation Project (SIP) approved by ICAO Council. The Seminar was attended by 71 experts and civil/military authorities from 11 CAR States, 5 SAM States and 2 International Organizations.

6.2 The seminar consisted of theoretical and practical presentations using an interactive format, high-level discussions, ICAO guidance material applied to civil/military cooperation activities with practical exercises adapted to regional situations, airspace optimization as well as CO_2 gas reduction initiatives through improved civil/military coordination.

6.3 The outcome of the Seminar is as follows:

- State obligations under ICAO SAR provisions;

- better understanding of ICAO initiatives regarding to search and rescue (SAR) and civil/military coordination;

- recent amendments to IAMSAR Manual;

- SAR organization and planning, agreements and operational procedures between civil/military authorities;

- encourage SAR exercises between States;

- encourage development of SAR coordination and emergency response procedures for natural disasters;

- exchange operational experiences on civil/military coordination to ensure safety of civil aviation operations;

- SAR quality assurance principles;

- SAR regional analysis based on USOAP-CMA results;

- establish regulatory framework for the airspace organization and management (AOM) to increase ATS airspace capacity;

- implement regional initiatives for reduction of the permanently segregated volumes of airspace to achieve the Flexible Use of Airspace (FUA) in the CAR/SAM Regions;

- coordination between civil/military authorities to implement PBN operational initiatives so as to reduce civil aviation fuel burn and CO_2 gas emissions;

- risk management of hazards to civil aircraft operations based on Doc Doc 9985, ATM Security Manual;

- national programmes to reduce aircraft interceptions based on Doc 9433;

- implementation progress of automatic dependent surveillance-broadcast (ADS-B) and 406 MHz emergency locator transmitter (ELT);

- promotion of civil-military cooperation and coordination in support to SAR services and optimum use of airspace by all users, to effectively meet expectations of civil air transportation system, national defense and environmental;

- to encourage regional activities of civil-military cooperation and coordination in CAR/SAM Regions in 2015, to follow up outcome of the Seminar.

6.4 Some participant States as Brazil, Cuba, Dominican Republic, Ecuador, Haiti, Honduras, Paraguay, Trinidad & Tobago and USA, presented the audience their experiences on SAR subjects.

6.5 The main conclusion of the Seminar/Workshop was that the promotion of civil/aviation cooperation and coordination is essential in support of optimum use of airspace by all users, to effectively meet operational requirements of air transportation, national defense and environmental conservation. In such sense, follow-up actions are to be maintained to enhance such coordination activities.

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