

SAT/22



INTERNATIONAL CIVIL AVIATION ORGANIZATION

WESTERN AND CENTRAL AFRICAN OFFICE

**REPORT OF THE TWENTY SECOND MEETING ON THE
IMPROVEMENT OF AIR TRAFFIC SERVICES OVER THE SOUTH
ATLANTIC (SAT/22)**

(Paris, France, 07-09 June 2017)

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PART I: HISTORY OF THE MEETING

1 Place and duration of the meeting

The Twenty Second Informal Coordination Meeting on the improvement of air traffic services over the South Atlantic (SAT/22) was held at the **Musée Mendjisky**, located 15 Square de Vergennes, 75015, Paris, France, from **07 to 09 June 2017** back to back with the SAT/FIT/12 meeting held in parallel with the CNMC/7 meetings from **05 to 06 June 2017**, at the kind invitation of the French Direction Générale de l'Aviation Civile (**DGAC**).

2. Opening ceremony

2.1 The meeting was officially opened on the 05th June 2017 by **Mr. Jerome Journet**, Chef du service Navigation Aérienne d'Antilles Guyane DGAC, France. He was assisted by **Mr. Pascal Senard**, Special Advisor to the Director for Overseas, Air Navigation Service Directorate, DSNA/DGAC, France. **Mr. Journet** firstly welcomed the participants to the three meetings (**CNMC/7, SATFIT/12 and SAT/22**) being held back to back and encouraged them to feel at home in Paris which was chosen by French DGAC to replace Cayenne due to the current social situation in this city. Then, he outlined the continuous success of the SAT Group achievements with regard to the tangible improvement of ATS safety, capacity, efficiency and the contribution to the preservation of the environment over the South Atlantic (**SAT**). In this regard he recalled the participants with several achievements of the SAT Group which were recorded by the aviation community as success stories. He recalled also how France is actively involved in the activities of the SAT Group through the activities of the Cayenne Flight Information Region and reaffirmed the strong commitment of his State to conduct his part of the work carried out by the SAT Group. Finally, he wished fruitful deliberations and a nice stay in France to the participants.

3. Organization, Secretariat and attendance

3.1 **Mr. Pascal Senard**, Special Advisor to the Director for Overseas, Air Navigation Service Directorate, the French ANSP, was unanimously elected as Chairperson of the SAT meeting. He therefore chaired and moderated its plenary sessions.

3.2 **MM. François-Xavier Salambanga**, Regional Officer CNS, **Albert Aidoo Taylor**, Regional Officer ATM & SAR, ICAO WACAF Office and **Mr Onofrio Smarrelli** Regional Officer CNS, SAM Office served as the Secretary of the meeting and accordingly prepared and aligned the Working and Information papers.

3.3 The meeting was attended by Fifty-Four (**54**) participants from Fourteen (**14**) States of the ICAO AFI, EUR, NACC and SAM regions namely, **Angola, Argentina, Brazil, Cabo Verde, Côte d'Ivoire, France, Ghana, Guinea, Portugal, Senegal, South Africa, Spain, Trinidad de Tobago, United States of America** including their Air Navigation Service providers (**ASECNA, ASA, ENAIRE, ENANA, DGCTA, NAV Control, FAA**) and **four (04)** representatives of the aeronautical industry (**AIREON, IATA, INEO, SITA**).

3.4 The detailed list of participants and their contact addresses is at **Appendix A** to this report.

4. Working languages

The meeting was conducted in the English language and the documentation was presented in this language.

5. Agenda of the meeting

The meeting adopted the following agenda and discussed its items when appropriate, within the ATM Working Group, the CNS Working Group or during the plenary sessions.

Agenda Item 1: Election of the chairperson and adoption of the agenda (Plenary session)

Agenda Item 2: *Air Traffic Management (ATM)*

- 2.1 Follow up of SAT/21 Conclusions pertaining to the ATM field
- 2.2. SATMA report on Traffic Statistics, Safety procedures and operational procedures in the EUR/SAM corridor.
- 2.3. Follow up on operations in the AORRA airspace.
- 2.4. ATS Contingency planning
- 2.5. Any other ATM business

Agenda Item 3: *Communications, Navigation and Surveillance (CNS)*

- 3.1 Follow up of SAT/21 Conclusions pertaining to the CNS field
- 3.2 Revue of the performance of SAT CNS Infrastructure and systems
- 3.3 Improvement of CNS system in the SAT Region (AMHS, AIDC, ADS-B)
- 3.4 Any other CNS business

Agenda Item 4: *Communications, Navigation and Surveillance / Air Traffic Management (CNS/ATM) Systems*

- 4.1 Harmonization of ADS/CPDLC programmes
 - 4.1.1 Review of the conclusions/decisions of the tenth of SAT FANS 1/A Interoperability Team (SAT/FIT/12).
 - 4.1.2 Interconnection of ADS-C systems
- 4.2 Performance Based Navigation (PBN) in the South Atlantic RNP4 in the EURSAM corridor
- 4.3 Review of the conclusions/decisions of CNMC/7 meeting

Agenda Item 5: *Adoption of the conclusions/decisions of the SAT/22*

Agenda Item 6: *Future work programme*

Agenda Item 7: *Any other business*

6. Conclusions and Decisions of the meeting

The meeting adopted eight (08) Conclusions and eight (08) Decisions listed as following:

Agenda Item 2: **Air traffic management (ATM)**

Decision 22/01: **Analysis of Traffic Statistics for Strategic Planning**

That,

In order for SATMA to make recommendations from analysis of traffic statistics which could be used for strategic planning, the SAT Group and Users (IATA) may identify and specify a particular area of study for which SATMA may provide additional assistance, subject to the availability of resources.

Decision 22/02: **EURSAM Airspace Concept**

That,

Following the publication of the 16th Edition of PANS ATM Doc 4444 and the introduction of the PBCS requirements in the provision of ATM, an EURSAM corridor new airspace concept on Time Based Separation (as attached in Appendix F to this report) is adopted to replace previous airspace concept.

Decision 22/03: Creation of ATS routes

That,

Two ATS routes MAVKO - GOGSO-GARPO- and KOTVO- PUBLI- TUTLO in the SAT area be established and extended to facilitate traffic flow when contingency procedures are in effect in the SAT region.

Decision 22/04: **Implementation of Reduced Separation Minima in line with PBCS in the entire SAT area.**

That,

Considering the implementation of the PBCS concept requirements for flights operating to NAT region from March 2018, the SAT Group study the implementation of Reduced Separation Minima in line with PBCS requirements to facilitate the provision of seamless services in the entire SAT area.

Agenda Item 3: Communications, Navigation and Surveillance (CNS)

3.1 Follow up of SAT/20 Conclusions pertaining to the CNS field

Conclusion 22/05: Reporting on the work of the multidisciplinary local Group for the assessment and the mitigation of missing Flight Plans

That;

In order to ensure an efficient interconnection of ATM/CNS systems SAT ACCs continue the assessment and mitigation of missing Flight Plans through the work of their local multidisciplinary Group established for this purpose, share the result with concerned neighbors and report quarterly to the coordinator (ASECNA) for summary and yearly report to the SAT.

Conclusion 22/06: Establishment of SITA Gateways on SAT VSATS networks

That;

Concerned SAT ACCs:

- a) **Take benefits of the experience conducted in the SAM and AFI regions in the establishment of SITA Gateways on REDDIG and AFISNET networks to support ADS-C & CPDLC data where possible;**
- b) **Conduct prior to implementation a cost benefit analysis;**
- c) **Ensure the full reliability of the system.**

3.2 Revue of the performance of SAT CNS Infrastructure and systems

Decision 22/07: Establishment of a Technical Group for the identification of CNS systems performance

That;

- a) **A Technical Group composed with ASECNA, Brazil, Capo Verde, Ghana, Portugal is established with the mandate to define, identify and assess SAT CNS systems performance;**
- b) **The Group under the leadership of Ghana will submit to SAT members a draft list of performance and metrics by 30 June 2017 for comments and amendments to be sent no later than 31 July 2017;**
- c) **The draft document will be finalized no later than 30 September 2017 and forwarded to ANSPs for first reporting on SAT CNS performance before 31 January 2018;**
- d) **The technical group will work with the assistance of the Secretariat through e-mailing and Teleconferences.**

3.3 Improvement of CNS system in the SAT Region (AMHS, AIDC, ADS-B)

Conclusion 22/08: Continuation of teleconferences for the coordination of the interconnection of AMHS systems in the SAT Region

That;

SAT concerned ANSPs with the assistance of ICAO Regional Offices of Lima and Dakar pursue the teleconferences and bilateral exchange in order to finalize the following ongoing AMHS interconnection exercises:

- a) **Casablanca/Lisbon;**
- b) **Ezeiza/Johannesburg;**
- c) **Dakar/ Recife**
- d) **Abidjan/Accra.**

Conclusion 22/09: Implementation of AIDC between Abidjan and Accra

That;

In consideration of the initiative already undertaken, ASECNA and GCAA pursue their concertation in order to finalize the roadmap and implement AIDC between Abidjan and Accra with regard to the following schedule:

- a) First trial between Abidjan and Accra to start on 15 July 2017**
- b) Full operational implementation by 31 January 2018.**

Conclusion 22/10: Implementation of AIDC between Accra and Luanda

That;

GCAA and ENANA develop a roadmap for the implementation of AIDC between Accra and Luanda comprising at least:

- a) The elimination of the deficiency on the Accra/Luanda VSAT link;**
- b) The definition of AIDC messages set.**

Conclusion 22/11: Extension of the participation in the teleconferences to ATS Experts

That;

In order to ensure an effective interconnection of SAT CNS & ATM systems complying with the requirements identified by the ATM WG, ANSPs nominate ATS Experts to attend the future teleconferences on the interconnection of AMHS systems and the implementation of AIDC.

Conclusion 22/12: Establishment of ATM/CNS systems Cyber Security Policies, Plans and Procedures

That;

- a) In order to ensure the Security of ATM/CNS systems, ANSPs should develop and implement Cyber Security Policies, Plans and Procedures comprising Security Risk Assessment and personnel training and report on the initial initiative no later than 31 December 2017;**
- b) In this respect, DSNA France could assist SAT ANSPs when necessary.**

Conclusion 22/13: Training needs on ATM/CNS Cyber Security

That;

SAT ANSPs identify Cyber Security training requirements, develop and implement Cyber Security training programme and organize with the assistance of ICAO Workshops in order to sensitize all the stakeholders involved in the provision and usage of air navigation service.

3.4 Any other CNS business

Agenda Item 4: Communications, Navigation and Surveillance / Air traffic management (CNS/ATM) Systems (Plenary session)

4.1 Harmonization of ADS/CPDLC programmes

4.1.1 Review of the conclusions/decisions of the eleventh meeting of the SAT FANS 1/A Interoperability Team (SAT/FIT/11).

Decision 22/14: Adoption of the Conclusions/Decisions of eleventh meeting of SAT FANS 1/A Interoperability Team (SAT/FIT/12).

That;

The Conclusions and Decisions and Plan of Action of the SAT FANS 1/A Interoperability Team twelfth meeting are adopted as attached in APPENDIX H1.

4.2 Review of the conclusions/decisions of CNMC/7 meeting

Decision 22/15: Adoption of the Conclusions/Decisions of CNMC seventh Meeting

That;

The Conclusions and Decisions of the meeting of the CAFSAT Network Management Committee (CNMC) are adopted as attached at APPENDIX H2.

Agenda Item 5: Adoption of the conclusions/decisions of the SAT/22 meeting

Agenda Item 6: Future work programme

Decision 22/16: Terms of Reference and Future work programme of the SAT

That;

The Terms of Reference and Future work programme of the SAT ATM Working Group (ATM/WG), SAT Study Group on the Improvement of the Airspace Structure in the EUR/SAM Corridor (IAS/SG), SAT CNS Working Group (CNS/WG) are adopted as attached at APPENDIX K.

Agenda Item 7: Any other business

Part II: REPORT ON THE AGENDA ITEMS**Agenda Item 1: Election of the chairperson and adoption of the agenda**

1.1 Under this agenda item the meeting unanimously elected. Mr. **Pascal Senard**, Special Advisor to the Director for Overseas, Air Navigation Service Directorate, the French ANSP as Chairperson of the SAT meeting. He therefore chaired and moderated its plenary sessions and was assisted by the Secretariat.

1.2 The meeting reviewed and adopted the draft agenda and work programme proposed by the Secretariat.

Agenda Item 2: Air traffic management (ATM)**Agenda item 2.1: *Follow up of SAT/21 Conclusions pertaining to the ATM field***

2.1.1 The meeting reviewed the Conclusions and Decisions pertaining to the ATM field which were adopted by the SAT 21 meeting held in Lisbon, Portugal, from 6 to 10 June 2016. The meeting noted that the implementation of these conclusions and decisions were ongoing, or needed continuous actions to be taken by concerned parties.

2.1.2 Decisions 21/01, 21/03a, 21/04a, 21/07a and Conclusions 21/05, 21/06, 21/09 and Rec/21/11 were adjudged to be completed.

2.1.3 Decisions 21/02, 21/03b, 21/07b & 7c, 21/08, 21/10 and Conclusion 21/09 were adjudged to be Still Valid.

2.1.4 Decision 21/04a was adjudged to be no longer required whilst Decision 21/04b was considered as part of the revised EUR/SAM Corridor Airspace Concept implementation.

2.1.5 In reviewing SAT 21 Decision 21/02 regarding status of the three-phased EURSAM Corridor Airspace Concept Implementation Action Plan, the meeting was briefed on Amendment 7a and 7b to PANS ATM Doc 4444 in relation to the implementation of Performance Based Communication and Surveillance (PBCS) and the application of Time Based Separation. The meeting decided to revise or replace the previous EUR/SAM Corridor Airspace Concept with a new one which will incorporate 5 minutes Time Based Separation enabled by the application of PBCS.

2.1.6 In reviewing Decision 21/04 in relation to training for application of RNAV/ RNP 4 Separation over the Oceanic Airspace and Regulatory Approval, ASECNA reported their request for RNAV training was no longer required in view of the adoption of Time Based Separation for application in the EUR/SAM Corridor. In addition, the meeting decided that RNP 4 training and Regulatory Approval Process course for States/ANSPs should be considered as part of the revised EUR/SAM Corridor Airspace Concept implementation activity instead of a standalone action.

2.1.7 In reviewing Decision 21/07 relating to ATM Contingency Plan for SAT region, the meeting recalled the current situation in Qatar and the role of the high-seas in international air navigation, reiterating the importance of the subject and urged ATNS as the leader and States/ANSPs to consider the subject as a matter of priority.

2.1.8 In reviewing Recommendation, 21/11, Aireon informed the meeting that the total cost for data services to provide coverage of the SAT region with ADS-B reception from Space is calculated to be

approximately 7.9 M USD. This cost is a summary of the individual cost per FIR in the SAT region. Added to this cost will be installation of the interface between Aireon and the ANSP and the cost of transporting the data over LAN or Satellite.

2.1.9 The meeting acknowledged the significant improvements achieved in the Cayenne FIR as a result of collaboration between Cayenne FIR and the formalization of cooperation with adjacent ATC units. The meeting noted the airspace improvements around ILDIR and the significant reduction in the number of ATS incidents and lauded the implementation of the decisions of the SAT 21 meeting.

The status of implementation of SAT 21 Conclusions and Decisions pertaining to the ATM field is attached in **Appendix B1**.

2.2 Agenda Item 2.2: SATMA report on Traffic Statistics, Safety procedures and operational procedures in the EUR/SAM corridor

2.2.1 Traffic Statistics in the EUR/SAM corridor

2.2.1.1 SATMA presented its report on the collection and analysis of the statistical data of air traffic movement along the EUR-SAM Corridor.

2.2.1.2 The total traffic in the corridor in 2016 was calculated at 26,359 operations, representing 1.6 % drop and the lowest figure registered in EUR/SAM Corridor since 2004. The SAT Group recognized a reduction in traffic along the EUR SAM corridor. This was assessed to be largely due to increasing use of random routing by operators in order to take advantage of the jet stream wind patterns, thus reducing flights along established fixed ATS routes. The meeting noted the need to consider the introduction of more flexibility in flight planning and operational options for operators.

Preliminary analysis for 2017 showed an upward trend with the daily average demand increasing from 72 in 2016 to 79 in 2017. The details of the traffic statistics in the EUR/SAM corridor, as Appendix C to this report refers.

2.2.1.3 The meeting also identified the need for more analysis on the traffic statistics to facilitate forward planning and strategic decision making affecting the EUR SAM corridor, and noted that SATMA could be called upon, where necessary, to provide assistance. The Group therefore formulated the following Decision.

Decision 22/01: Analysis of Traffic Statistics for Strategic Planning

That,

In order for SATMA to make recommendations from analysis of traffic statistics which could be used for strategic planning, the SAT Group and Users (IATA) may identify and specify a particular area of study for which SATMA may provide additional assistance, subject to the availability of resources.

2.2.2 EUR/SAM Corridor Risk Assessments and reported 2016 LHD analysis

SATMA functions

2.2.2.1 SATMA was tasked by the SAT group to conduct studies to assess and analyze the conditions for safe application of RVSM-and RNP10 in EUR/SAM Corridor. The EUR/SAM corridor became RVSM-RNP10 airspace in January 2002 after an initial Safety Assessment, at which time it became mandatory for SATMA to perform and present periodically an RVSM RNP-10 Post-implementation Analysis about the situation in the EUR/SAM Corridor in order to ensure that critical parameters stay within safe parameters in order to maintain the required Target Level of Safety.

2.2.2.2 Following the establishment of Regional Monitoring Agency (RMA) functions by ICAO, SATMA has been performing the required periodical Risk Assessment for the Region since RVSM/RNP10 was implemented in EUR/SAM corridor. As a matter of interest, however, a new recommendation has been added by RMAs in order to initiate follow-up action on any aircraft that might fly in RVSM airspace without the given approval.

2.2.3 Safety Assessment in the EUR/SAM Corridor for 2016

2.2.3.1 The LHD default time, value to be applied when real data is not available, has been revised to 5 minutes due to the fact that new systems, aircraft capabilities, coverage and procedures (OLDI, ADS, Satellite) have improved ATC provision in the corridor. A discussion regarding this decision is required for any future plans for a reduction in longitudinal separation minima. The implementation and monitoring of FANS (ADS/CPDLC) may assist with revising the LHD impact.

2.2.3.2 The EUR/SAM Corridor Safety Assessment for 2016 covers traffic data from January to June 2016, and LHDs for the 2016 calendar year. The safety assessment in the EUR/SAM corridor which was submitted to SAT 22 meeting is attached as Appendix D to this report. The group was informed that the full 2016 EUR/SAM Corridor Safety Assessment report would be available via the website: www.satmasat.com.

2.2.4 LHD Monitoring in the EUR/SAM Corridor

2.2.4.1 Information is an essential input for Collision Risk Modelling, the model adopted by ICAO for EUR/SAM RVSM/RNP10 Safety Assessments. When data is not available for the input of the required parameters, the values for hypothesis must be taken from the most conservative figures which invariably affect the results and conclusions. The need for data is especially more important for Oceanic Areas, as data estimations must be applied to large distances.

2.2.4.2 Currently, almost all medium/long term projects being considered by the SAT group are targeting reduction of spacing between aircraft, and exploring optimal use of flight levels and longitudinal separations in the corridor. This planning consideration dictates the need to conduct LHD investigations, a mandatory requirement in order to minimize the impact of those conservative values.

2.2.4.3 The new EUR/SAM airspace concept introduces new challenges in operations and procedures as well as conducting assessments. Additional requirements must be applied for the monitoring of LHDs/LD by States/ANSPs, since the current arrangement whereby States/ANSPs submit LHD reports to SATMA (before 5th of month) appears inadequate. It is essential that each State/ANSP sends LHD reports with all fields completed with the requisite details, and, if any data is not available, investigates the causes for deviation within the established structure of the operator or organization involved.

2.2.4.4 SATMA presented the report of the 2016 LHDs in the EUR/SAM corridor and detailed in Appendix E to this report. Lack of coordination of traffic between ACCs was identified as a major cause of LHD occurrences in the SAT area. The group discussed the need to conduct further analyses into the causes of LHDs in order to determine and deploy appropriate mitigation actions to address them.

2.2.4.5 The meeting was advised about an analysis conducted by NavCanada, regarding the estimated impact of Space-based ADS-B surveillance on Vertical Collision Risk in the ICAO NAT region and how through the use of the system, it was estimated that collision risks could be improve by as much as 77%.

2.2.4.6 Aireon offered its assistance to the SAT group in conducting a similar analysis for the SAT on the use of Space-based ADS-B and how it could improve upon the reduction of lateral and LHD risks.

2.2.4.7 With regards to LHDs and unknown traffic in the SAT Region the meeting noted the reported improvement by Argentina following discussions with industry partners such as IATA, IFALPA and IFATCA regarding LHDs in the airspace. The meeting was informed by Argentina that the Caribbean and South American Monitoring Agency (CARSAMMA) had reported 49 LHD occurrences (2015) and therefore, urged the SAT Group to request for improved coordination between ATS units and the respective ACCs. The meeting recalled that this had been addressed to the ICAO Secretary General and several discussions had been held at various forums on the subject. The SAT Group urged Argentina to address the reported LHD cases by CARSAMMA through established regional structures.

2.2.4.8 In consideration of the fact that the SAT Group is an informal body constituted essentially of industry partners, the meeting noted that the concern related to LHD and unknown traffic in the South Atlantic raised in Conclusion SAT 19/10 remained valid.

2.2.5 EUR-SAM Corridor Airspace Concept

2.2.5.1 The meeting recalled that SAT 21 created a task force composed of focal points from EUR/SAM corridor member States/ANSPs (Brazil, Cape Verde, Senegal, Spain), SATMA, ICAO (WACAF & SAM) and IATA to update the “EUR/SAM Corridor Airspace Concept”. This team, called ESCIT (EUR-SAM Corridor Implementation Team), with Portugal as team leader had several videoconferences in order to define milestones and establish an implementation schedule for the project. The primary target of the airspace concept was towards implementation of a 50NM longitudinal separation (in a short/medium term) and RNP4 (as final target). The project was divided in three different phases: two for 50 NM (first in tactical and then with FANS required), and a final one for RNP4.

2.2.5.2 The meeting was apprised of the recent amendments of ICAO PANS ATM Doc 4444, regarding the application of longitudinal distance-based separation minima values of 50 NM and 30 NM, both predicated on a set of minimum requirements which include the requirement for direct pilot controller voice communication or CPDLC and ADS-C position reports as prerequisite for aircraft to be authorized for RNP-10 or RNP-4 operations.

<i>Separation minima</i>	<i>RNP type</i>	<i>Maximum ADS-C periodic reporting interval</i>
93 km (50 NM)	10	27 minutes
	4	32 minutes
55.5 km (30 NM)	4	14 minutes

2.2.5.3 The SAT /22 meeting was informed that in November 2016, ICAO Doc 4444 (Pans ATM) introduced for the first time the concept of Time-Based Longitudinal Separation Minima, so not only distance criteria might be applied.

<i>Mínimas de separación</i>	<i>RNP</i>	<i>RCP</i>	<i>RSP</i>	<i>Máximo intervalo de notificación periódica de ADS-C</i>
93 km (50 NM)	10	240	180	27 minutos
55,5 km (30 NM)	4	240	180	32 minutos
5 minutos	2 o 4	240	180	12 minutos
	2 o 4 o 10	240	180	14 minutos

2.2.5.4 Based in new ICAO documentation, a five (5) minutes longitudinal separation may be applied, under certain conditions:

- RNP: Required Navigation Performance
- RCP: Required Communication Performance
- RSP: Required Surveillance Performance

2.2.5.5 The meeting was informed that the requirement for application of RCP240 and RSP180 in Time-Based Separation also applies in the implementation of 50NM and 30NM longitudinal separation, except that, a different time for periodic contract for ADS-C is to be added to the initial EUR/SAM Airspace Concept Action Plan.

2.2.5.6 In case that the new time-based criteria is adopted by SAT members, it should be a matter for ESCIT (EUR-SAM Corridor Implementation Team) to define the RCP and RSP figures required by operators in the corridor (apart of fulfilling flight plan codes), and how ANSPs Systems should be updated or configured.

2.2.5.7 RCP240 assumes that the communication system bound to enable the application of the 5 minutes' separation minima shall allow a controller, within 4 minutes, to intervene and resolve a potential conflict by contacting an aircraft using an alternative communication. An alternative means shall be available to allow the controller to intervene and resolve the conflict within a total time of 10.5 minutes, should the normal means of communication fail.

2.2.5.8 Application of RSP180, when an ADS-C periodic or waypoint change event report is not received within 3 minutes of the time it should have been sent, the report is considered overdue and the controller shall take action to obtain the report as quickly as possible, normally by ADS-C or CPDLC. If a report is not received within 6 minutes of the time the original report should have been sent, and there is a possibility of loss of separation with other aircraft, the controller shall take action to resolve any potential conflict(s) as soon as possible. The communication means provided shall be such that the conflict is resolved within a further 7.5 minutes.

2.2.5.9 When information is received indicating ground or aircraft equipment failure or deterioration below the communication, navigation and surveillance performance requirements, ATC shall then, as required, apply alternative separation minima.

2.2.5.10 ICAO has published the Guidelines for the Implementation of Performance-based Longitudinal Separation Minima in ICAO Circular 343. The Circular 343 contains detailed information on the analysis used to determine these separation minima and monitoring procedures.

2.2.5.11 There is a requirement for a region or State to undertake an implementation safety assessment. In principle, this comprises two parts, namely, a safety assessment for navigation performance and a hazard assessment. In practice, only a hazard assessment needs to be performed for any local implementation since the safety assessment for the navigation performance under the various navigation specifications is valid for any implementation. The hazard analysis is to identify hazards and related mitigation measures that are specific to the local situation. To assist regions and States with their implementation safety assessment, a State implementation plan will be provided.

2.2.5.12 From the foregoing, the meeting decided to review and replace the EUR/SAM corridor airspace concept and formulated the following Decision.

Decision 22/02: EURSAM Airspace Concept

That,

Following the publication of the 16th Edition of PANS ATM Doc 4444 and the introduction of the PBCS requirements in the provision of ATM, an EURSAM corridor new airspace concept on Time Based Separation (as attached in Appendix C2 to this report) is adopted to replace previous airspace concept.

2.3 Agenda Item 2.3: Follow up on operations in the AORRA airspace.

2.3.1 Implementation of Night Routes in Cayenne

2.3.1.1 The implementation of a night routing scheme in Cayenne Oceanic airspace since 4th February 2016 has enabled Cayenne ACC to maintain a high safety standard during peak traffic hours between 03:00 and 07:00 UTC, and provided additional benefit of permitting Flexible routing during this period.

2.3.1.2 Pursuant to SAT 21 conclusion 21/06 which encouraged Cayenne FIR and adjacent SAT FIRs to formalize cooperation by constituting an Air Traffic Flow Management team to manage capacity for flights across the FIRs, the under listed activities were taken.

Cayenne has conducted the following actions:

a) Cooperation with adjacent SAT FIR

- Dakar Meeting (November 2016) Signature of the Cayenne- Dakar LOA
- Belem Meeting (December 2016) Discussion with Manaus and Atlántico for a new scheme route from Cayenne to SLI
- Creation of five-letters name code Cayenne entry points

b) Modernization Cayenne ACC

- Separation has been reduced from 120 NM to 100 NM (to cope with adjacent centers separation)
- A new version of ATM system CACAO (ADS C CPDLC) implemented in June 2016
- Progressive implementation of AIDC functions
- The experimentation of an ADS B image (installation of 2 antennas in October 2017)
- Development of traffic prediction

2.3.1.3 A working group, “traffic flow management surrounding Oceanic Cayenne airspace” comprising Dakar, Recife, Manaus, Piarco and IATA was urged to continue studies on routes and airspace structure, taking into account the different air traffic flows for achieving the best mix in terms of safety and capacity. In addition, Cayenne proposed the under-listed activities to be conducted with the team:

- a) With Brazil
 - Routes to SLI
 - Airspace classification
- b) With Dakar and Brazil
 - Discuss the use of triple point (MOVGA) with all units
 - Develop traffic prediction

2.3.1.4 Cayenne reported ongoing plans to establish RNAV domestic routes in the SOOO FIR. Cayenne informed the meeting that the night routes which were established in 2015 will be extended and published in the French AIP (with 9th November 2017 as publication date), as RNAV Domestic routes with the current restrictions. Cayenne also reported shortage of controller and ongoing efforts to attain the required number of ATCOs and normalize operations.

2.3.1.5 A coordination meeting was held among Santa Maria, Sal, Dakar, Cayenne- Atlantico and Piarco ACCs, and IATA, regarding a request by Cayenne for the establishment and extension of two ATS routes to facilitate traffic flow during contingency in SAT region. From the outcome of the coordination meeting, the following decision was formulated.

Decision 22/03: Creation of ATS routes

That,

Two ATS routes MAVKO - GOGSO-GARPO- and KOTVO- PUBLI- TUTLO in the SAT area be established and extended to facilitate traffic flow when contingency procedures are in effect in the SAT region.

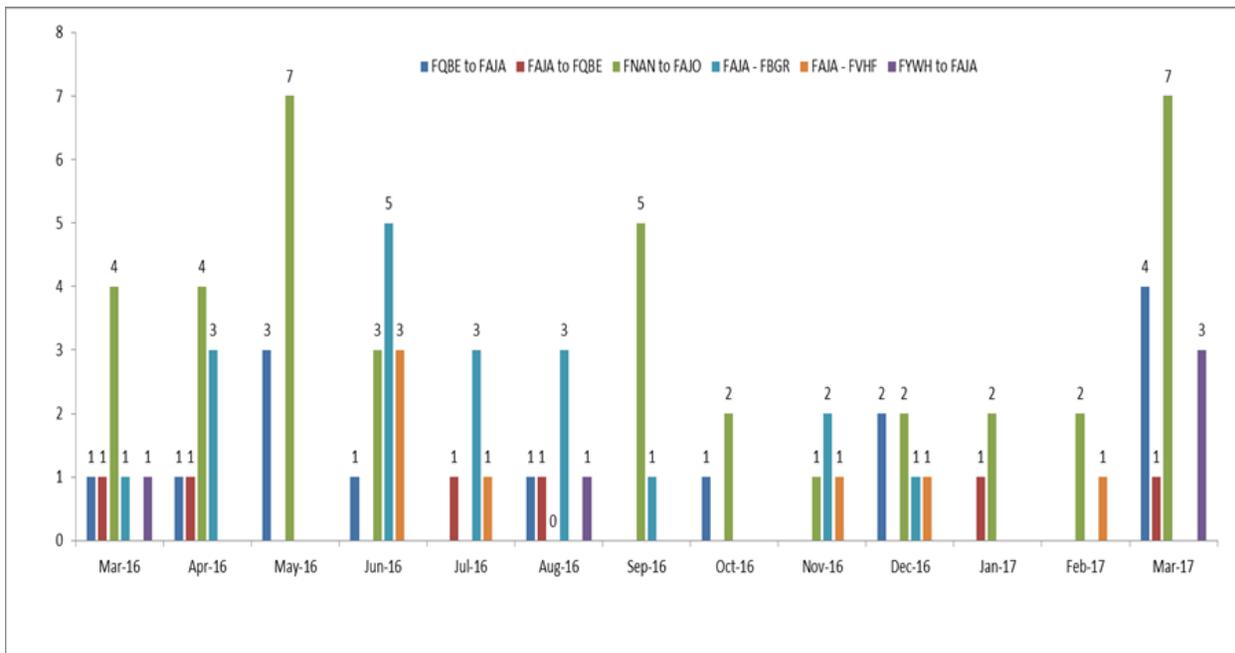
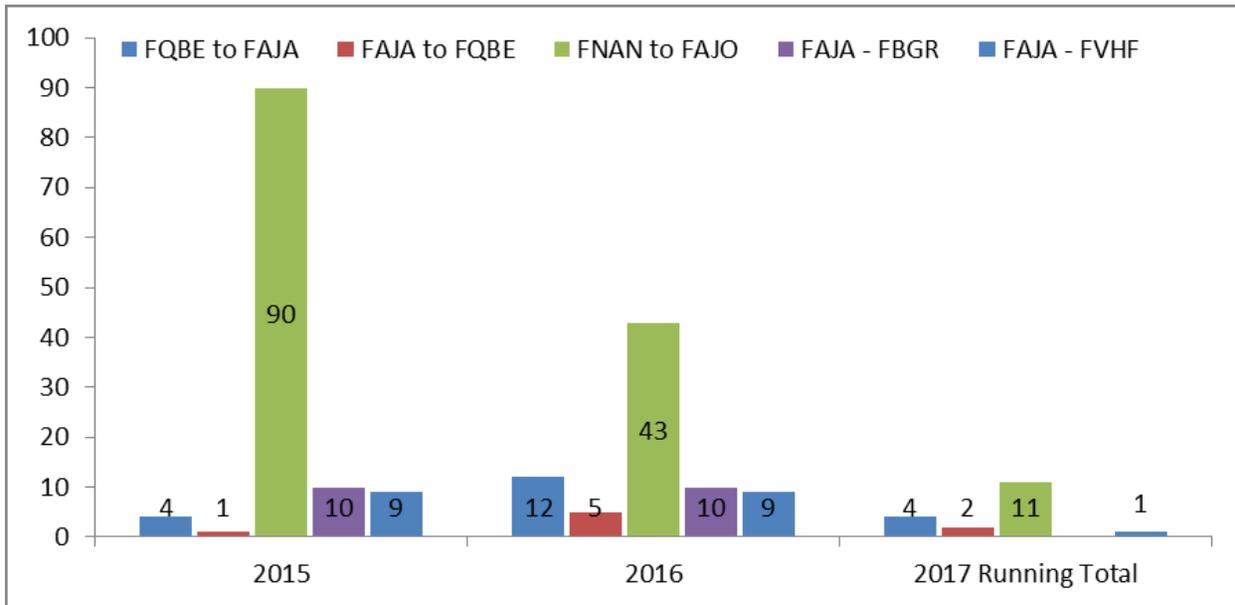
2.3.1.6 The meeting listed the following activities to be carried out in relation to the implementation of the routes:

- a) Team members:
Santa Maria, Sal, Dakar, Cayenne, Atlantico, Piarco and IATA
- b) Action:
 - Cayenne will send draft of these routes to all team members
 - Cayenne will propose entry, exit and crossing points (5LNC)
 - Common AIRAC date will be coordinated and agreed upon for the publication.

2.3.2 Airspace reorganization at ILDIR

2.3.2.1 The SAT Group recalled that SAT 21 meeting was briefed about the safety situation in the AORRA airspace around the position ILDIR. SAT 21 therefore urged the concerned FIR’s; Luanda, Johannesburg and Windhoek as a matter of urgency, to implement agreements reached in respect of airspace re-organization over the position ILDIR.

2.3.2.2 The meeting noted the significant improvement in safety and efficiency in the AORRA airspace following the airspace reorganization at ILDIR.



2.3.2.3 The meeting was provided with updates on the status of ADS-C/CPDLC implementation and its current operational status in the Luanda FIR, Angola and urged ATNS and ENNA to update the ATS Letters of Agreements to further improve coordination and air traffic management. Additionally, the meeting observed that that implementation of AIDC by the ANSPs of Angola, Namibia and South Africa will further improve safety and efficiency in the AORRA airspace and urged ASNPs to coordinate AIDC implementation between the ATC units.

2.3.3.2 Extension of PBCS application in the EUR SAM region to cover the entire SAT region

The SAT Group was brief on the new requirements for aircraft operating in the NAT region to be PBCS compliant from March 2018. Considering the significant improvements to be gain through reduction of separation minima afforded by the application of the PBCS concept, the SAT Group decided to study the possibility of extending PBCS application in the EUR SAM region to cover the entire SAT region.

Decision 22/04: Implementation of Reduced Separation Minima in line with PBCS in the entire SAT area.

That,

Considering the implementation of the PBCS concept requirements for flights operating to NAT region from March 2018, the SAT Group study the implementation of Reduced Separation Minima in line with PBCS requirements to facilitate the provision of seamless services in the entire SAT area. (ATNS)

2.4 ATS Contingency planning in SAT area

2.4.1 The SAT 22 meeting expressed dissatisfaction about the delay in finalizing the draft ATS Contingency planning for the SAT area, noting that the plan has been under discussions for almost five years.

2.4.2 The meeting noted the plan lacked the inclusion of ATM contingency planning of some FIRs. It was noted that focal points for certain FIRs have failed to provide the requisite information and have neither provided comments on the draft as requested by previous SAT meetings.

2.4.3 In reviewing the draft ATM Contingency Plan attached to this report as Appendix G which was adopted by previous meeting, it was noted that it not did contain provisions for Volcanic Ash and Public Health Emergencies as required by PANS ATM Doc 4444.

2.4.4 The meeting adopted a project methodology in order to facilitate the finalization of the ATM Contingency Plan for the SAT area.

2.5. Any other ATM business

2.5.1 Serious concerns were expressed about the inability of SAT States/ANSPs to implement most of the conclusions and decisions from previous meetings. The meeting discussed and agreed that there was the need to adopt a different methodology in order to make substantial progress on all the outstanding items for which the conclusions and decisions were adopted. As a means of achieving effectiveness and implementation of SAT decisions, the SAT ATM Working Group decided to avoid the formulation of new conclusions and decisions on programmes which are being already addressed by the SAT Group; instead, the meeting preferred to align those outstanding conclusions and decisions or programmes current requirements. The five programmes listed by the SAT 22 ATM WG are:

- AORRA post Implementation and PBCS application in entire SAT area
- EUR SAM Corridor Risk Assessment and LHD Monitoring
- EUR SAM Corridor Traffic Statistics
- ATM Contingency Plan for the SAT Area
- EUR/SAM Corridor Airspace Concept Project

2.5.2 The Group decided to appoint Champions to liaise with the ICAO Secretariat and SAT Rapporteur in order to coordinate and follow-up on implementation activities by State/ANSPs and other stakeholders. The Group decided to adopt a tracking mechanism to follow-up implementation of the activities to be completed in the execution of the five programmes.

2.5.6 The Plan of Action for the programmes, the champions and memberships of the implementation teams, timelines where applicable and the tracking tools are listed below.

Plan of Action, SAT 22, ATM WG

2.5.6.1 SAT ATM P1: AORRA post Implementation and PBCS application in entire SAT area

SAT ATM P1	AORRA post Implementation and PBCS application in entire SAT area		
Team	Champion: ATNS (Sibusiso Nkabinde) Go-Team: ATNS, ASECNA, ASA, DECEA, DSNA, GCAA, IATA.		
Relevant actions:		Action Owner	Completion date
▪ Monitor and Report status of coordination Failures	<input type="checkbox"/>	ATNS	
▪ Assess PBCS Implementation readiness for AORRA	<input type="checkbox"/>	ATNS	

2.5.6.2 SAT ATM P2: EUR SAM Corridor Risk Assessment and LHD Monitoring

SAT ATM P2	EUR SAM Corridor Risk Assessment and LHD Monitoring		
Team	Champion: SATMA Go-Team: ASECNA, ASA, DECEA, ENAIRE, IATA.		
Relevant actions:		Action owner	Completion date
▪ EUR/SAM States to provide LHD reports monthly (entirely and correctly – Time duration and FANS connection are critical data to be reported).	<input type="checkbox"/>	States/ANSP	On-Going
▪ EUR/SAM States to send traffic data monthly for 2017 (Data received later than December 31st will not be processed).	<input type="checkbox"/>	States/ANSP	
▪ SATMA to send document “DATA NEEDED FOR EUR/SAM MONITORING AND ASSESMENT” as published	<input type="checkbox"/>	SATMA	
▪ SATMA to report to EUR/SAM LHD Monitoring Team quarterly	<input type="checkbox"/>	SATMA	

2.5.6.3 SAT ATM P3: EUR SAM Corridor Risk Assessment and LHD Monitoring

SAT ATM P3	EUR SAM Corridor Traffic Statistics		
Team	Champion: SATMA Go-Team: ASECNA, ASA, DECEA, ENAIRE, IATA.		
Relevant action:		Action Owner	Completion Date
<ul style="list-style-type: none"> ▪ SATMA to include information about Flight Level occupancy <input type="checkbox"/> 		SATMA	SAT 23

2.5.6.4 SAT ATM P4: ATM Contingency Plan

SAT ATM P4	ATM Contingency Plan		
Team	Champion: ASECNA (NGOMA-Mby Alain Gerard) Go-Team: ATNS, ASECNA, ASA, DECEA, ENAIRE, DSNA, GCAA, IATA.		
Relevant actions:		Action Owner	Completion date
<ul style="list-style-type: none"> ▪ Go –Team to update the Sat Contingency Plan to include Volcanic Ash, Public Health Emergency Contingencies and Directory List into the Sat Contingency Plan <input type="checkbox"/> 		Go-Team	
<ul style="list-style-type: none"> ▪ All Sat States to be included in the SAT Contingency Plan <input type="checkbox"/> 		Go-Team	
<ul style="list-style-type: none"> ▪ Go-Team to distribute the Sat Contingency Plan to all Sat States <input type="checkbox"/> 		Go-Team	31 st August 2017
<ul style="list-style-type: none"> ▪ All SAT States are to submit any changes or comments to be included in the SAT contingency plan <input type="checkbox"/> 		SAT States	30 th November 2017
<ul style="list-style-type: none"> ▪ Go-Team to send Completed document to ICAO <input type="checkbox"/> 		Go - Team	15 th December 2017

2.5.6.5 SAT ATM P5: EUR/SAM Corridor Airspace Concept Project

SAT ATM P5	EUR/SAM Corridor Airspace Concept Project		
Team	Champion: NAV Portugal (Nuno Simões) Go-Team: ESCIT		
Relevant actions:		Action Owner	Completion date
<ul style="list-style-type: none"> ▪ States providing air traffic services in the EUR/SAM corridor to agree on 5 minutes Reduced longitudinal Separation minima in accordance with ICAO Doc 4444, (as EUR/SAM Corridor Airspace Concept, Annex X refers) <input checked="" type="checkbox"/> 		See Proj.Descrp. Eur/SAM Corridor Airspace Concept	
<ul style="list-style-type: none"> ▪ States providing air traffic services in the EUR/SAM corridor to update the national regulation and guidance materials in accordance to ICAO Doc 4444 <input type="checkbox"/> 			
<ul style="list-style-type: none"> ▪ All SAT States to establish a PBCS regulatory Framework to conduct a gap analysis for PBCS implementation readiness and develop their National Action Plan. This includes a SAT Conclusion for a supporting State Letter <input type="checkbox"/> 			

advising SAT States to conduct such activities;		
<ul style="list-style-type: none"> ▪ In View of the ICAO amendments on PBCS and reduced separations with applicability to the EUR/SAM Airspace Concept, the ICAO AFI and SAM, urges SAT States of the Operator (or Registry) to take appropriate measures to develop, establish and implement necessary policies and procedures to ensure that their operators conducting flights in the EUR/SAM Corridor are approved and compliant with PBCS requirements. 	<input type="checkbox"/>	
<ul style="list-style-type: none"> ▪ States providing air traffic services in the EUR/SAM corridor to find measures of establishing local means of collecting and sharing PBCS performance data in a standardized format defined/agreed for the CFRA 	<input type="checkbox"/>	

2.5.6.6 SAT ATM P6: Creation of ATS routes MAVKO - GOGSO-GARPO- and KOTVO- PUBLI-TUTLO

SAT ATM P5	Creation of ATS routes MAVKO - GOGSO-GARPO- and KOTVO- PUBLI-TUTLO		
Team	Champion: Cayenne Team Members: Santa Maria, Sal, Dakar, Cayenne, Atlantico, Piarco and IATA		
Relevant actions:	Action Owner	Completion date	
<ul style="list-style-type: none"> ▪ Send draft of these routes to all team members 	<input type="checkbox"/>	Cayenne	
<ul style="list-style-type: none"> ▪ Cayenne will propose entry, exit and crossing points and Coordinates of 5LNC 	<input type="checkbox"/>	Cayenne	
<ul style="list-style-type: none"> ▪ Agree on common implementation date 	<input type="checkbox"/>	Team Members	
<ul style="list-style-type: none"> ▪ Common AIRAC date will be coordinated and agreed upon for the publication 	<input type="checkbox"/>	Team Members	
<ul style="list-style-type: none"> ▪ Update ATS Letters of Agreements between ACCs 	<input type="checkbox"/>	Team Members	

Agenda Item 3: Communications, navigation and surveillance (CNS)

3.1 Follow up of SAT/21 Conclusions pertaining to the CNS field

3.1.1 Under this agenda item the meeting reviewed the conclusions and decisions of the SAT/21 meeting pertaining to CNS field as attached in **Appendix B2**. The meeting reviewed the status of implementation of Conclusion 21/12: Establishment of multidisciplinary local Group for the assessment and the mitigation of missing Flight Plans. It was noted that progress was made in the establishment of local multidisciplinary missing Flight Plans Investigation Groups including airlines in Cayenne, Eizeza, Luanda, and Montevideo. The meeting encouraged Centers to continue their effort in the assessment and mitigation of missing flight plans and report to ASECNA nominated to coordinate their action. The following conclusion was formulated:

Conclusion 22/05: Reporting on the work of the multidisciplinary local Group for the assessment and the mitigation of missing Flight Plans

That;

In order to ensure an efficient interconnection of ATM/CNS systems SAT ACCs continue the assessment and mitigation of missing Flight Plans through the work of their local multidisciplinary Group established for this purpose, share the result with concerned neighbors and report quarterly to the coordinator (ASECNA) for summary and yearly report to the SAT.

3.1.2 The Secretariat informed the meeting on the successful experience carried out on the REDDIG network consisting to transport the SITA information for the data link in Chile. ASECNA also informed the meeting on the arrangements with SITA in order to ensure the datalink through the SITA gateway enabling the connection with the AFISNET Network.

The meeting agreed that SAT members should take benefits of these successful trials to establish similar interconnections in support to ADS-C and CPDLC operations. They were encouraged to conduct cost benefits analysis prior to implementation and to ensure full reliability of the links. The following conclusion as formulated:

Conclusion 22/06: Establishment of SITA Gateways on SAT VSATS networks

That;

Concerned SAT ACCs:

- a) **Take benefits of the experience conducted in the SAM and AFI regions in the establishment of SITA Gateways on REDDIG and AFISNET networks to support ADS-C & CPDLC data where possible;**
- b) **Conduct prior to implementation a cost benefit analysis;**
- c) **Ensure the full reliability of the system.**

3.2 Revue of the performance of SAT CNS Infrastructure and systems

3.2.1 Under this agenda item the meeting discussed the performance of SAT CNS systems and noted the lack of a comprehensive reporting material. It was agreed to establish a technical group tasked to identify the performance of the SAT CNS systems.

3.2.2 After the establishment of a set of parameters to assess with indicators every SAT member will be urged to periodically report on the performance of his CNS system.

The following decision was formulated:

Decision 22/07: Establishment of a Technical Group for the identification of CNS systems performance

That;

- a) **A Technical Group composed with ASECNA, Brazil, Capo Verde, Ghana, Portugal is established with the mandate to define, identify and assess SAT CNS systems performance;**

- b) **The Group under the leadership of Ghana will submit to SAT members a draft list of performance and metrics by 30 June 2017 for comments and amendments to be sent no later than 31 July 2017;**
- c) **The draft document will be finalized no later than 30 September 2017 and forwarded to ANSPs for first reporting on SAT CNS performance before 31 January 2018;**
- d) **The technical group will work with the assistance of the Secretariat through e-mailing and Teleconferences.**

3.3 Improvement of CNS system in the SAT Region (AMHS, AIDC, ADS-B)

3.3.1 Implementation of AMHS

3.3.1.1 The Secretariat summarized for the attention of the meeting (**WP12**) the status of implementation of AMHS in the SAT Centers. It was recalled that Conclusion 21/16 considers that in order to implement the AMHS circuits between Buenos Aires and Johannesburg, Recife and Dakar, Argentina, Brazil, Senegal and South Africa, should nominate by end of July 2016 AMHS interconnection Focal Points and initiate the elaboration of a study for the interconnection of their AMHS systems in accordance with the AFI and SAM regional ATN routing tables and organize in this respect a monthly AMHS Focal Points teleconference with the Secretariat (ICAO Regional Offices Lima and Dakar) to follow up the progress.

3.3.1.2 Four teleconferences involving Focal Points (List in **Appendix H.1**) were reported to have been held in order to initiate the coordination and the establishment of activities necessary for the migration of AFTN circuit to AMHS circuit between Brazil and Senegal, Argentina and South Africa.

3.3.1.3 Argentina, Brazil, Senegal and South Africa reported through the first teleconference that their AMHS systems are fully implemented and gave progress made through their Regional and Interregional activities with reference to the AMHS interconnection:

3.3.1.3.1 Argentina reported that at regional level, successful operational trials on AMHS interconnection were conducted between the MTA of Ezeiza with Lima, Montevideo and Santiago. AMHS between Ezeiza and Brasilia was in a pre-operational phase since 17th May 2017. The meeting was also informed that with respect to AMHS interregional connection, initial coordination with Spain was conducted for the AMHS circuit implementation. The possibility to implement the AMHS circuit through a MPLS circuit through their local communication service communication provider was initially considered.

3.3.1.3.2 Brazil reported their successful AMHS operational interconnection with Spain (MTA Brasilia –MTA Madrid 16th May 2017) through the CAFSAT, with Colombia (MTA Bogotá 22nd May 2017), with Guyana (MTA Georgetown 10th May 2017) and with Uruguay (MTA Montevideo 10th May 2017).

3.3.1.3.3 Regarding inter-regional AMHS interconnection connections between AFI and SAM Regions, it was considered during the teleconferences to use the SAM and WACAF Regional guidelines for the implementation of AMHS interconnection based on the **Appendix E** of EUR AMHS Manual, version 4.0, EUROCONTROL. It was also reminded that the SAM Region has developed a model of Memorandum of Understanding (**MoU**) for AMHS interconnection. This information available at the following link: <http://www2010.icao.int/SAM/Pages/eDocumentsDisplay.aspx?area=CNS> would be used in order to establish all the technical and operational considerations.

3.3.1.4 For the AMHS trials between AFI and SAM Regions it was recommended to use the Spain – Brazil AMHS interoperability trials document that is presented as **Appendix H.2** this report.

3.3.1.4.1 In reference at the AMHS interconnection between Brazil and Senegal (Recife –Dakar), the meeting noted that the main AMHS system in Brazil is in Brasilia, therefore, the AMHS connection is Brasilia-Dakar. Recife is a site where is installed the node of CAFSAT and AFISNET that communicated with Dakar. Brazil informed to plan to implement the AMHS circuit between Brasilia and Dakar through the AFISNET and not through the CAFSAT network, the implementation on which will be postponed until more technical information of how implement this circuit in the CAFSAT is obtained. These circuits, once implemented, will be the backup of the AMHS circuit through the AFISNET. The focal point of Senegal agreed in all the consideration above considered for the AMHS interconnection between Brasilia and Dakar.

3.3.1.4.2 In the fourth teleconference made the 9th of May 2017, Brazil reported that the installation of the AFISNET node in Recife was completed and they are ready to coordinate the AMHS trials with Dakar. It was expected that during this SAT/22 meeting, final coordination will be made between Brazil and Senegal for the implementation of AMHS trials between Brasilia and Dakar.

3.3.1.4.3 In relation to the initial coordination for AMHS trials between Argentina and South Africa (MTA Ezeiza – MTA Johannesburg) Argentina reported in the fourth teleconference that considering the limited availability of the CAFSAT node in Ezeiza (Buenos Aires) the AMHS trials between the MTA of Johannesburg and the MTA of Ezeiza would be made as originally planned through the public internet via a VPN circuit, the configuration circuit is presented as appendix to WP13 of SAT/22 related to the follow up of AIDC between AFI and SAM Region.

3.3.1.4.5 Additionally to the AMHS initially coordination for the implementation of AMHS activities between Argentina South Africa and Brazil, Senegal (Conclusion SAT 21/16) during the third AMHS/AIDC teleconference it was considered that SAT/22 analyze the possibility to implement a new AMHS circuit between AFI and SAM not established in the SAM and AFI Regional Air Navigation Plans as the circuit between Luanda (Angola) and Brasilia.

3.3.1.4.6 The Focal Point of Angola reported news about the CAFSAT in Luanda informing that the CAFSAT node in Luanda was completed the week of the 28th November 2016 and the system provides ATS/DS with Recife and an additional data link with Lisbon. Initial ATS/DS tests carried out with Recife indicates the system is properly working. As far AMHS system in Luanda is concerned, the system is operational since 2012 and is linked with Brazzaville as part of AFI Plan and all neighboring states.

3.3.1.5 In consideration of the result presented in **Appendix H.3**, the meeting applauded the progress made through the teleconferences and encouraged concerned ANSPs to pursue the teleconferences and bilateral exchange in order to finalize the ongoing AMHS interconnection exercises. The following conclusion was formulated:

Conclusion 22/08: Continuation of teleconferences for the coordination of the interconnection of AMHS systems in the SAT Region

That;

SAT concerned ANSPs with the assistance of ICAO Regional Offices of Lima and Dakar pursue the teleconferences and bilateral exchange in order to finalize the following ongoing AMHS interconnection exercises:

- a) **Casablanca/Lisbon;**
- b) **Ezeiza/Johannesburg;**
- c) **Dakar/ Recife**
- d) **Abidjan/Accra.**

3.3.2 Implementation of AIDC

3.3.2.1 The Secretariat summarized for the attention of the meeting (WP13) the status of implementation of AIDC in the SAT Centers. The meeting was also informed on the coordination activities undertaken by the Secretariat through the teleconferences held amongst AIDC Focal Points as. Actions similar to those undertaken for the implementation of AMHS were conducted.

3.3.2.2 In this regard it was reported that Argentina implemented an AIDC national connection between the ACC of Ezeiza with the ACC of Cordoba that is in a preoperational phase, it is expected by the end of 2017 that all Argentina national ACCs will operate with AIDC. Positive AIDC trials with Chile and Paraguay were reported to have been conducted. However, in consideration of the limited availability of the CAFSAT node in Ezeiza (Buenos Aires) node, the initial implementation of AIDC trial between Ezeiza and Joannesburg can be established through a VPN circuit through public internet, the same circuit proposed for AMHS trials. The VPN circuit is presented as **Appendix I.1** of this report. The AIDC trials using the AFTN circuit between Ezeiza and Johannesburg will be made once Argentina implemented the modernization at the CAFSAT node that is expected by the middle of 2018.

3.3.2.3 Brazil reported to have AIDC in operational phase among all the Brazil national ACCs with the exception of Atlántico ACC, where the AIDC was expected to be ready at the end of the first semester of 2017. The following AIDC connections have been carried out between all their national ACCs from May to July 2016 using new automation system.

3.3.2.4 Brazil will be ready to start AIDC trials with Senegal and South Africa in the second semester of 2017 once in Atlántico ACC operate the new automation system that is in this moment in the installation phase.

3.3.2.5 South Africa reported to have implemented AIDC between its two FIRs North and South and with Australia since 2010, and have also made trials with Botswana and Namibia without positive result.

3.3.2.1 The AIDC ICD used in SAM and AFI Region are based on the ASIA/PACIFIC Regional Interface Control Document (ICD) for ATS Interfacility Data Communications (AIDC). The ICD AIDC for the SAM Region is available at the following web portal <http://www2010.icao.int/SAM/eDocuments/AIDCv7TechnicalAspects%20rev2015.pdf>. The SAM Region use only a minimum set of AIDC messages see **Appendix I.2**.

For the AIDC coordination the States involved nominated focal points; the list of focal point is presented as **Appendix I.3**.

3.3.2.6 In reference to the AIDC trial requirement between French Guyana and Senegal, France reported to be ready to start AIDC trials at the first semester of 2018 once they complete the installation of the new AMHS system in Cayenne. **Appendix I.4**, presents the AIDC current status connection and planning at regional and interregional including AFI region for the SAM Region. In consideration of this reported status of implementation the meeting noted that progress was notably made in the SAM region.

3.3.2.7 The Ghana Civil Aviation Authority (GCAA) provided the meeting (WP15) with an update on the progress made by Ghana towards the implementation of Air Traffic Service (ATS) Inter-facility Data Communication (AIDC).

In the process of installing a new ATM system which would be AIDC capable, GCAA identified the ATS units of Abidjan and Luanda for the exchange with progress ongoing with ASECNA with

respect to Abidjan. A roadmap of activities aimed at helping Ghana achieve complete AIDC capability was shared with the meeting.

The meeting applauded this initiative and encouraged ASECNA and GCAA to pursue their concertation in order to finalize the roadmap and implement AIDC between Abidjan and Accra.

The following Conclusion was formulated:

Conclusion 22/09: Implementation of AIDC between Abidjan and Accra

That;

In consideration of the initiative already undertaken, ASECNA and GCAA pursue their concertation in order to finalize the roadmap and implement AIDC between Abidjan and Accra with regard to the following schedule:

- a) **First trial between Abidjan and Accra to start on 15 July 2017**
- b) **Full operational implementation by 31 January 2018.**

3.3.2.8 Examining the roadmap shared by Ghana the meeting strongly encouraged GCAA (Ghana) and ENANA (Angola) to develop a similar roadmap for the implementation of AIDC between Accra and Luanda comprising at least the elimination of the deficiency on the Accra/Luanda VSAT link and the definition of AIDC messages set.

The following conclusion was formulated:

Conclusion 22/10: Implementation of AIDC between Accra and Luanda

That;

GCAA and ENANA develop a roadmap for the implementation of AIDC between Accra and Luanda comprising at least:

- a) **The elimination of the deficiency on the Accra/Luanda VSAT link;**
- b) **The definition of AIDC messages set.**

3.3.2.9 Cabo Verde provided the meeting (**WP 23**) with the major benefits expected from automated exchange of flight data. The meeting was informed that in order to ensure interoperability with all correspondents, Sal ACC is envisaging the replacement of the existing ATM system with a new one having both AIDC and OLDI standards.

3.3.2.10 Examining the results obtained by the teleconference the meeting noted during the discussion it may sometime be appropriate to have the view of ATS experts to ensure that the technical arrangements will fulfill the operational requirements.

It was therefore agreed that the teleconference should be extended to ATS Experts

The following conclusion was formulated:

Conclusion 22/11: Extension of the participation in the teleconferences to ATS Experts

That;

In order to ensure an effective interconnection of SAT CNS & ATM systems complying with the requirements identified by the ATM WG, ANSPs nominate ATS Experts to attend the future teleconferences on the interconnection of AMHS systems and the implementation of AIDC.

3.3.2.11 IATA provided the meeting (**WP 21**) with its views and expectation from the implementation of AMHS and AIDC and encouraged ATSU, States/ANSPs to develop and sign Memoranda of Understanding (MoUs) and a guidance document addressing the checklist, in order to provide instructions to specific agreements needed when implementing AIDC or AMHS. The document should specify the facilities and messages to be used for the exchange of notification, coordination, confirmation, transfer of control, and transfer of Data link communication related data between automated ATS systems, connectivity between FPL ATC systems, AMHS or AFTN channels to be used, a test protocol, pre-operational/operational tests, operating stage (LoA).

3.3.3 Cyber security for ATS information

3.3.3.1 DSNA - French Guiana introduced to the meeting (**WP 22**) the growing challenges on Aeronautical Information systems security. It was noted that as information technologies are central to air navigation services and are provided from various international and external sources. They are therefore target for cyber-attacks today. The meeting also recognized that the threats are real and can take several forms depending on the means of the hackers requiring networks between ANSP as vital for the safety of Air Traffic Services.

3.3.3.2 DSNA French shared with the meeting examples of best practices to address those threats and take measures to contend with them. In view of the above SAT ANSPs/States were strongly encouraged to develop and implement Cyber Security Policies, Plans and Procedures comprising Security Risk Assessment and personnel training.

The following conclusion was formulated:

Conclusion 22/12: Establishment of ATM/CNS systems Cyber Security Policies, Plans and Procedures

That;

- a) In order to ensure the Security of ATM/CNS systems, ANSPs should develop and implement Cyber Security Policies, Plans and Procedures comprising Security Risk Assessment and personnel training and report on the initial initiative no later than 31 December 2017;**
- b) In this respect, DSNA France could assist SAT ANSPs when necessary.**

3.3.3.2 The meeting also recognized the importance of personnel training in order to address cyber-attacks and encouraged SAT ANSPs/States to identify Cyber Security training requirements, develop and implement Cyber Security training programme and organize with the assistance of ICAO Workshops in order to sensitize all the stakeholders involved in the provision and usage of air navigation service.

The following conclusion was formulated:

Conclusion 22/13: Training needs on ATM/CNS Cyber Security

That;

SAT ANSPs identify Cyber Security training requirements, develop and implement Cyber Security training programme and organize with the assistance of ICAO Workshops in order to sensitize all the stakeholders involved in the provision and usage of air navigation service.

3.3.4 Implementation of ADS-B Space

3.3.4.1 The meeting was also provided with a detailed description of the testing method and performance of the Aireon Space Based ADS-B reception from the first 3 ADS-B receiver payloads of the total constellation of 72 payloads to be deployed into Space.

An updated estimation of completion of the Iridium Next Satellite Constellation and an estimated cost for the SAT region to be serviced by Space Based ADS-B was brought to the attention of the meeting.

3.3.4.2 The meeting noted the progress and confirmed the interest for SAT members to follow up with the industry the development of ADS-B based surveillance capability.

3.4 Any other CNS business

3.4.1 Under this agenda item Trinidad de Tobago and Portugal expressed the need and their will to establish an ATS/DS circuit between Piarco and Santa Maria by end of September 2017. Similar requirement was also identified between Trinidad de Tobago and Cabo Verde with a link to be established by end of December 2017.

3.4.2 The meeting agreed on the proposal as well as with the technology consisting to use a secured VPN/IP channels to establish the links and suggested that each counterpart should nominate a coordinator and provide details including e-mail.

Agenda Item 4: Communications, navigation and surveillance / Air traffic management (CNS/ATM) Systems (Plenary session)

4.1 Harmonization of ADS/CPDLC programmes

4.1.1 Review of the conclusions/decisions of the twelfth SAT FANS 1/A Interoperability Team (SAT/FIT/12).

The SAT Group reviewed the conclusions/decisions of the SAT FIT/12 meeting held from 5 to 6 June 2017. The SAT FIT/12 adopted two (02) Conclusions and one (01) Decision that were endorsed by the meeting. The Conclusions and Decisions of SAT FIT/12 are attached in **Appendix J.1**.

Decision 22/14: Adoption of the conclusion/decision of SAT FANS 1/A Interoperability Team (SAT/FIT/12).

That;

The Conclusions and Decisions of SAT FANS 1/A Interoperability Team are adopted as attached at APPENDIX J.1.

4.1.2 Interconnection of ADS-C systems

Under this agenda item the meeting considered the progress made in the implementation of AMHS systems as enabler to the increase of the availability of Flight Plans which is essential to the safe operation of interconnect systems.

The meeting also noted the progress made in the implementation of ADS-C supported by automated ATM systems and encouraged SAT members to examine the best ways for the interconnection of ADS6C systems.

4.2 Performance Based Navigation (PBN) in the South Atlantic RNP4 in the EURSAM corridor

4.2.1 IATA as a major stakeholder and airspace user made reference to ICAO Amendment 7 (i.e. Amendments 7-A and 7-B), to the fifteenth edition of the Procedures for Air Navigation Services – Air Traffic Management (PANS-ATM), for applicability on November 2016 and made the following observations with regards to the EUR/SAM airspace concept, noting that the amendment was related to:

- Performance-based longitudinal and lateral separation minima and automatic dependent surveillance — contract (ADS-C) climb and descend procedure (CDP);
- Separation of departing aircraft from arriving aircraft that are following an area navigation (RNAV) or required navigation performance (RNP) route; and
- Data link initiation capability (DLIC), ADS-C, performance-based communication and surveillance (PBCS) and satellite voice communications (SATVOICE)

4.2.2 In order to exercise effective safety oversight of ANSP, States were entreated to ensure that ANSPs established a validation process that confirms regulatory and system readiness further ensure that they would meet the capability and performance requirements as related to PBCS.

4.2.3 States are encouraged to commence gap analysis for PBCS readiness and implementation and develop their individual action plan to address the gaps in accordance with the most recent version of ICAO PBCS Manual. The gap analysis should include the following implementation issues: State PBCS regulatory framework, operator operational approval, ATC Flight Plan Systems to support RCP/RSP codes filling, training for flight crews and other appropriate personnel, implementation of local and regional monitoring programs, and other items to be identified.

4.2.4 The gap analysis may vary for each SAT State, impacting on the desire for seamless operation and PBCS implementation across the EUR/SAM corridor. The EUR/SAM Airspace Concept Task Force thus should develop a regional work plan in order to ensure harmonization and synchronization of activities of the States. The updates should include frequent reviews on regulators', ANSPs' and operators' readiness.

4.2.5 The airspace concept for the SAT region and associated action plans should be reviewed and updated. This review should include a collective re-assessment of a realistic implementation date for the updated EUR/SAM airspace concept in the SAT area. Additionally, a transitional strategy to progressively achieve operational goals of the updated airspace concept should also be developed and regionally agreed. During the transitional period, the principle of Most Capable Best Served (MCBS) can be used to encourage progress, while fairly accommodating legacy aircraft.

4.2.6 Moreover, to achieve a high level of operational performance across the corridor, SAT States are urged to establish local means of collecting and sharing PBCS-related data in a standardized format defined/agreed for the Regional Monitoring Program (RMP). The tasks of this RMP should be defined and may include but not limited to:

- ensure centralized support to accommodate specific, local, regional and global needs;
- validation of submitted data before importing it into a secure centralized database;
- maintain data, such as related to the ANSP, CSP, aircraft type and aircraft operator;
- manage resources and contracts, costs recovery and secure access to the services and information;
- support participating ANSPs in the analysis and reporting of the operational data at the regional level:

- coordinate, with other regional monitoring programs, such as those established for monitoring RVSM (e.g. ARMA & SATMA);
- provide means to receive, track, manage problem reports (e.g. web-based service);
- provide a diagnosis of the problem and recommend resolutions; and
- notify appropriate parties when the operational performance does not meet the RCP/RSP specification.

4.2.7 In light of the information presented above, IATA supports the following recommendations:

- a) SAT States to conduct a gap analysis for PBCS implementation readiness and develop their National Action Plan. This includes a SAT Conclusion for a supporting State Letter advising SAT States to conduct such activities;
- b) SAT Task Force, in close coordination with airline operators, to develop a harmonized and coordinated regional action plan with timeline based on the gap analysis;
- c) SAT Task Force to review the SAT airspace concept and revisiting targeted operational improvements, PBN and PBCS requirements to be applied, realistic implementation dates and the need for a regional transitional strategy;
- d) SAT Task Force to invite ICAO to expedite the development and the publication of guidance material for PBCS Operational Approval;
- e) SAT States, who have not done so, to start training on PBN and PBCS for their staff and to establish a State policy and State regulatory frameworks supporting the eventual implementation of PBN and PBCS; and
- f) SAT States and ANSPs to find measures for the establishment of local and regional PBCS monitoring programs to perform local/regional analysis for identifying problems and taking necessary corrective action.

NB: The Working paper on Performance Based Navigation (PBN) in the South Atlantic RNP4 in the EURSAM Corridor was discussed alongside the EUR/SAM new airspace concept implementation plan in agenda item 2.2.5.

4.3 Review of the conclusions/decisions of CNMC/7 meeting

4.3.1 Under this agenda item, the meeting reviewed the conclusions/decisions of CNMC/7 meeting held from 5 to 6 June 2017. CNM/7 formulated eleven (11) draft Conclusions and three (3) draft Decisions that were endorsed by the meeting. The Conclusion and Decisions of CNMC/7 are attached at **Appendix J.2** and the detailed report on CNMC/7 can be downloaded from the WACAF meetings Webpage.

The following Decision was formulated:

Decision 22/15: Adoption of the Conclusions/Decisions of CNMC seventh Meeting

That;

The Conclusions and Decisions of the seventh Meeting of the CAFSAT Network Management Committee (CNMC/7) are adopted as attached at Appendix J.2.

Agenda Item 5: Adoption of the Conclusions/Decisions of the SAT/22 meeting

5.1 Under this agenda item, the meeting reviewed and adopted the draft Conclusions and Decisions presented by the Secretariat. It was agreed that the Secretariat will finalize and upload the report on the ICAO SAM & WACAF Regional Offices Webpages.

Agenda Item 6: Future work programme

6.1 The meeting reviewed and amended the Terms of Reference and Work Programme of the SAT Groups (ATM/WG, IAS/SG, and CNS/WG) as presented in **Appendix K** to this report;

The following decision was formulated:

Decision 21/16: *Terms of Reference and Future work programme*

That;

The Terms of Reference and Future work programme of the SAT ATM Working Group (ATM/WG), SAT Study Group on the Improvement of the Airspace Structure in the EUR/SAM Corridor (IAS/SG), SAT CNS Working Group (CNS/WG) are adopted as attached at Appendix K.

Agenda Item 7: Any other business (Plenary session)

7.1 The meeting examine the issue related to the future date and venue of SATFIT/13, CNMC/8 and SAT/23 meetings. ATNS South Africa kindly offered to host these events. The meeting expressed its gratitude to South Africa and tasked the Secretariat (ICAO Regional WACAF Office) to finalize with the hosting State the date and venue and inform the SAT Group as soon as possible.

7.2 The meeting expressed its gratitude to France government, France DGCA and DSNA for the hospitality, friendly welcome and assistance provided to all the participants during their stay in Paris.

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