

SAT/21



**INTERNATIONAL CIVIL AVIATION ORGANIZATION**

**WESTERN AND CENTRAL AFRICAN OFFICE**

**REPORT OF THE TWENTY FIRST MEETING ON THE IMPROVEMENT  
OF AIR TRAFFIC SERVICES OVER THE SOUTH ATLANTIC (SAT/1)**

**(Lisbon, Portugal 6-10 June 2016)**

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## **PART I: HISTORY OF THE MEETING**

### **1 Place and duration of the meeting**

The Twenty First Informal Coordination Meeting on the improvement of air traffic services over the South Atlantic (**SAT/21**) was held at the **Tivoli Oriente** hotel, Lisbon, Portugal, from 08 to 10 June 2016 back to back with the SAT/FIT/11 in parallel with the CNMC/6 meetings held from 06 to 07 June 2016, at the kind invitation of NAV Control Portugal.

### **2. Opening ceremony**

2.1 The meeting was officially opened on the 06<sup>th</sup> June 2016 by **Mr. Luis COIMBRA**, CEO NAV Portugal. Mr. Coimbra, firstly welcomed the participants to the three meetings (CNMC/6, SATFIT/11 and SAT/21) being held back to back and encouraged them to feel at home in Lisbon. 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 Portugal is actively involved in the activities of the SAT Group through NAV Control, his Air Navigation Service Provider 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 Portugal to the participants.

### **3. Organization, Secretariat and attendance**

3.1 **Mr. Simões NUNO**, Head of Strategy & External Affairs, NAV Portugal was unanimously elected as Chairperson of the SAT meeting. He therefore chaired and moderated its plenary sessions.

3.2 **Mr. François-Xavier Salambanga**, Regional Officer CNS, **Mr. 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 Twelve (**12**) States of the ICAO AFI, EUR, NACC and SAM regions namely, **Angola, Argentina, Cabo Verde, Côte d'Ivoire, France, Ghana, 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**), five (05) representatives au the aeronautical industry (**AIRCON, AIREON, BOEING, IATA, INEO, ISEDEFE, 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 following agenda and discussed its items when appropriate, within the ATM Working Group, the CNS Working Group or the plenary sessions:

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

### **Agenda Item 2: Air traffic management (ATM) (by the ATM Working Group)**

*2.1 Follow up of SAT/20 Conclusions pertaining to the ATM field*

*2.2 EUR SAM Corridor*

*2.3 Follow up on operations in the AORRA airspace.*

*2.4 ATS Contingency planning*

*2.5 Performance Based Navigation*

*2.6 Any other ATM business*

### **Agenda Item 3: Communications, navigation and surveillance (CNS) (by the CNS Working Group)**

*3.1 Follow up of SAT/20 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 (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 I/A Interoperability Team (SAT/FIT/11).*

*4.1.2 Interconnection of ADS-C systems*

*4.2 Review of the conclusions/decisions of CNMC/6 meeting*

*4.3 Space-based ADS-B*

### **Agenda Item 5: Adoption of the conclusions/decisions of the SAT/21 meeting (Plenary session)**

### **Agenda Item 6: Future work programme (Plenary session)**

### **Agenda Item 7: Any other business (Plenary session)**

## 6. Conclusions and Decisions of the meeting

The meeting adopted Twenty Two (22) conclusions and decisions listed as following:

### **Agenda Item 2: Air traffic management (ATM) (by the ATM Working Group)**

### **List of SAT 21 Conclusions and Decisions pertaining to the ATM field:**

**Decision 21/01:      *Large Height Deviation Monitoring Team***

**That,**

- a) The Large Height Deviation (LHD) Monitoring Team is reestablished with membership from EUR SAM Member States/ANSPs;**
- b) EUR SAM States/ANSPs should nominate and provide contact details of monitoring members to SATMA by 30th September 2016, ensure that LHD reports are completed correctly and also, to ensure the data delivery schedule (annually every first 6 months ) for Safety Assessments in the EUR/SAM Corridor are met.**

**Decision 21/02:      *EUR SAM Corridor Airspace Concept Action Plan***

**That,**

**A three-phased EURSAM Corridor Airspace Concept Implementation Action Plan is agreed as follows:**

**Phase One: 50 NM Longitudinal Separation based on RNP10;**

**In implementing Phase One regarding 50NM longitudinal separation, States/ANSPs consider establishing Direct Segments for low-demand periods on bilateral basis, conduct individual cost/benefits, apply its internal Safety regulations and coordinate signing of related LoAs;**

**Phase Two: Mandated Data Link application for implementation of 50 NM Longitudinal Separation based on RNP10; and**

**Phase Three: 30 NM Lateral / Longitudinal Separation based on RNP4.**

**Decision 21/03:      *EUR SAM Airspace Concept implementation Task Force***

**That,**

- a) An EUR SAM Airspace Concept implementation Task Force is established with Focal Points attached in Appendix C1 of this report; and**
- b) The Task Force to update the EUR SAM Airspace Concept implementation plan, list the activities to be completed, determine individual State/ANSPs requirements and agree on implementation timelines for each of the three phases.**

**Decision 21/04:**     *Training for application of RNAV/ RNP 4 Separation over the Oceanic Airspace and Regulatory Approval*

**That,**

a) ASECNA shall conduct an identification of training needs for application of RNAV/RNP distance-based Separation and submit requests to Nav Portugal and ENAIRE (Spain) for consideration of assistance; and

b) ICAO liaises with the FAA and other ANSPs to arrange RNP 4 training and Regulatory Approval Process course for States/ANSPs.

**Conclusion 21/05:**   *Implementation of AORRA airspace re-organization over ILDIR*

**That,**

Considering the safety risk posed to flights operating in the AORRA airspace in Luanda, Johannesburg and Windhoek FIRs, ICAO ensures the agreements reached in respect of airspace re-organization of the position ILDIR be implemented as a matter of urgency.

**Conclusion 21/06:**   *Air Traffic Flow Management in the Cayenne FIR*

**That,**

Considering the significant improvements achieved in the Cayenne FIR as a result of collaboration between Cayenne FIR and adjacent SAT FIRs, the team formalizes the cooperation by constituting an Air Traffic Flow Management team for flights across the FIRs to manage capacity.

**Decision 21/07:**     *Adoption of ATM Contingency planning for SAT region*

**That,**

- a) The draft ATM Contingency Plan for the SAT region is adopted;
- b) Focal Points of SAT States/ANSPs to review and submit their final comments to the Team Leaders namely, South Africa and ASECNA by 30<sup>th</sup> September 2016; and
- c) Secretariat to submit final draft ATM Contingency Plan for the SAT region to the ICAO Council by 31<sup>st</sup> December 2016 for consideration and approval.

**Decision 21/08:**      *Common application of RNP 4 Regulatory Approval Process*

That,

The EUR SAM Corridor Airspace Concept implementation Task Force studies the establishment of a common application of RNP 4 Regulatory Approval Process for the SAT region.

**Conclusion 21/09:**      *Safety Risk to flights due to lack of communications by flights over high seas*

That,

In consideration of the serious safety risks posed by flights which operate in the SAT region without contacting the appropriate ATS units,

a) ACCs in the SAT area are urged to increase the level of coordination and collaboration to reduce the risks;

b) Brazil, Cape Verde and Senegal compile and investigate deliberate violations of ATC procedures by such flights and inform the States of Registry for the aircraft concerned; and

c) Compile the number of aircraft involved in the violations above, perform the appropriate analysis, determine disposition of an emerging trend and inform the respective ICAO Regional Office of potential risk to flights operating on the high seas in the SAT region for necessary action.

**Decision 21/10:**      *SAT Working Structure and collaboration with NAT region*

That,

The SAT region collaborates with the NAT region in order to share working experiences, best practices, pool resources and harmonize operations for the benefit of airspace users and increase efficiency in the management of flights across the two regions.

**Recommendation 21/11:**      *Consideration of Space-Based ADS-B in the SAT region*

That,

Aireon submits different models of cost options for the SAT region, for consideration by the Group

**Agenda Item 3: Communications, Navigation and Surveillance (CNS) (by the CNS Working Group)**

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

**Conclusion 21/12:** *Establishment of multidisciplinary local Group for the assessment and the mitigation of missing Flight Plans*

**That;**

SAT ACCs who have not yet done so namely, Luanda, Eizeza, Montevideo, Cayenne, Casablanca endeavor to establish as a matter of urgency but no later than 31 July 2016 the multidisciplinary local missing Flight Plans investigation groups as called upon by SAT Conclusion 20/12.

**Conclusion 21/13:** *Development and implementation of Work Programmes for the assessment and the mitigation of missing Flight Plans*

**That;**

**SAT ACCs:**

a) **Develop annual Programmes for the assessment and the mitigation of missing Flight Plans to be implemented by the multidisciplinary local Group.**

b) **Report quaternary to SAT current coordinator with copy to the Secretariat, the result of the investigation and mitigation of missing Flight Plans**

**Decision 21/14:** *Follow up of the mitigation actions of missing Flight Plans*

**That;**

**SAT Secretariat:**

a) **Summarize and forward SAT previous meeting Conclusions and Decisions related to missing flight Plans;**

b) **Develop and circulate for update, a table on the status of establishment by SAT ACCs of their multidisciplinary local Group with focal points;**

c) **Coordinate follow up through E-mailing and teleconferences the status of implementation of the annual programme for the assessment and mitigation of missing Flight Plans**

d) **Convey the first teleconference no later than 30 September 2016**

### **3.2 Revue of the performance of SAT CNS Infrastructure and systems**

**Decision 21/15:** *Improvement of the availability of air/ground data link in support to FANS/I (ADS-C/CPDLC) operation*

**That;**

SAT ACCs take benefit of the existing satellite based aeronautical Networks (AFISNET, CAFSAT, SADC/2, REDIG II and MEVAIII) to improve the availability of the air/ground data link through the conclusion of appropriate technical arrangements with their Communication Service Providers

(ARINC, SITA).

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

**Conclusion 21/16:** *Interconnection of AMHS systems between AFI and SAM Regions*

That;

In order to implement the AMHS circuits between Buenos Aires and Johannesburg, Recife and Dakar, Argentina , Brazil , Senegal and South Africa:

a) 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

b) Organize in this respect a monthly AMHS focal points teleconference with secretariat (ICAO Regional Offices Lima and Dakar) to follow up the progress, with the first teleconference starting on 4<sup>th</sup> August 2016

**Conclusion 21/17:** *Implementation of AIDC*

That;

a) Angola, Argentina, Brazil, Côte d'Ivoire, France Guyana, Senegal, South Africa and Uruguay conduct monthly if required teleconferences starting on 31<sup>st</sup> August of 2016 with the AIDC focal points and the SAT Secretariat, in order to study the implementation of AIDC interconnection between the AFI and SAM Regions.

b) ICAO Regional Offices Lima and Dakar coordinate through teleconferences the follow up of the implementation and interconnection of AIDC systems

**Conclusion 21/18:** *Follow up of the progress in ADS-B Space*

That;

In the framework of the future development of surveillance capability SAT ANSPs consider ADS-B space as an emerging technology candidate to complement the existing surveillance systems and an enabler for the development of aircraft Global Flight Tracking and follow up of the progress in the development of ADS-B Space .

### 3.4 Any other CNS business

**Decision 21/19:** *Amendment to CNMC Agenda*

That;

The agenda of the CAFSAT Management Committee (CNMC) be amended to include items to address CNS issues such as those raised by the FANS Central FANS Reporting Agency (CFRA), in support to FIT with the assessment of data link in support to FIT.

**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 21/20: *Adoption of the Conclusions/Decisions of eleventh meeting of SAT FANS 1/A Interoperability Team (SAT/FIT/11).***

**That;**

**The Conclusions and Decisions of the SAT FANS 1/A Interoperability Team eleventh meeting are adopted as attached in APPENDIX G1.**

**4.2 Review of the conclusions/decisions of CNMC/6 meeting**

**Decision 21/21: *Adoption of the Conclusions/Decisions of CNMC sixth Meeting***

**That;**

**The Conclusions and Decisions of the CAFSAT Network Management Committee (CNMC) are adopted as attached at APPENDIX G2.**

**Agenda Item 5: Adoption of the conclusions/decisions of the SAT/21 meeting (Plenary session)**

**Agenda Item 6: Future work programme (Plenary session)**

**Decision 21/22: *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 J.**

**Agenda Item 7: Any other business (Plenary session)**

**Part II: REPORT ON THE AGENDA ITEMS**

**Agenda Item 1: Election of the chairperson and adoption of the agenda**

1.1 Mr. **Simões NUNO**, Head of Strategy & External Affairs, NAV Portugal was unanimously elected as Chairperson of the SAT meeting. He therefore chaired and moderated its plenary sessions.

**Agenda Item 2: Air traffic management (ATM)****Agenda Item 2.2: SATMA report on Traffic Statistics, Safety procedures and operational procedures in the EUR/SAM corridor****2.2.1. Traffic Statistic of the EUR-SAM Area**

2.2.1.1 One important task of the SATMA is the collection and elaboration of the statistical data of the air traffic movements along the EUR-SAM Corridor. The importance of this data as well as its evolution during the past years has been strongly highlighted in previous SAT Meetings as an important base to take preventive actions in line with the evolution of these figures. The analysis of 2015 EUR-SAM Corridor traffic statistical data is available on SATMA web page: [www.satmasat.com](http://www.satmasat.com).

2.2.1.2 The 2015 statistical analysis of traffic figures along the EUR-SAM Corridor indicates a sharp decrease in comparison to recent years. The annual aircraft movement in the year 2015 was 24460. This is the lowest figure registered in the EUR/SAM Corridor since 2004 when SATMA began annual analysis of traffic statistics and amounts to an 8.71% reduction. The positive variance observed in the analysis was due to a slight increase in northbound traffic above the 2004 figure. However, the figure for southbound traffic recorded a significant reduction from 13,108 to 10,639.

2.2.1.3 Analysis of traffic statistics along the airways shows that trend have remained significantly unchanged, except that traffic along airways UN741 and UN857 have decreased. Once more, most of the traffic operated to airports that are located in Brazil and Portugal. However, both traffic to airports in those two States recorded significant reduction of 20% and 14% respectively from 2015 figures.

2.2.1.4 The ranking of airlines operating in the corridor has changed considerably. While Portugal Airline (TAP) maintained its position at the top, Iberia (IBE) has risen to the second spot, mainly due to the reduction in Air France (AFR) and LATAM Brasil (TAM) operations along the corridor.

2.2.1.5 The preliminary figures that have been deduced from the projected analysis of 2016 statistics show a similar trend to the 2015 report. For instance, the daily average demand in 2015 was 65 and the projection for 2016 currently stands as 66.

2.2.1.6 The extract of 2015 traffic statistics and analysis along the EUR SAM corridor is attached in **Appendix D** to this report.

**Agenda Item 2.2.2: EUR/SAM Corridor Risk Assessments and reported 2015 LHD analysis**

2.2.2.1 SATMA, as monitoring Agency, was nominated by SAT group to conduct studies and required assessments to analyze the conditions for the safety application of RVSM-and RNP10 in EUR/SAM Corridor. The EUR/SAM corridor became an RVSM-RNP10 area in January 2002 after an initial Safety Assessment. It became mandatory to conduct RVSM RNP-10 Post-implementation Analysis regarding the situation in the EUR/SAM Corridor in order to ensure that critical parameters stay within safe figures, and the required Target Level of Safety keeps below allowed figures.

2.2.2.2 Following RMA functions established by ICAO, SATMA has been performing required periodical Risk Assessment for the Region since RVSM/RNP10 was emplaced in EUR/SAM corridor. The 2015 EUR/SAM Corridor Risk Assessment and analysis of reported LHD is attached as **Appendix E1** to this report. As a matter of interest, a new recommendation has been added by the RMA group in order to initiate surveys to follow-up on any aircraft that might fly RVSM space without the given approval.

2.2.2.3 Lack of information is the worst enemy for Collision Risk Model, the model adopted by ICAO for EUR/SAM RVSM/RNP10 Safety Assessments. When no data is available for input parameters, the values for hypothesis must be taken from the most conservative figures and this, of course, penalizes the results and conclusions. This is especially important for Oceanic Areas, as data estimations must be applied to large distances.

2.2.2.4 Up today, almost all medium/long term projects which are being considered by SAT group are targeting the reduction of distances (longitudinal and lateral separations) between aircraft, and looking for optimal use of Flight levels in the corridor. It becomes essential to reinforce LHD investigations in order to minimize those conservative values. The LHD Monitoring Team” was created in SAT 14, with some concrete and defined Terms of reference which is annexed in **Appendix E2**.

2.2.2.5 EUR/SAM airspace new concept introduces new challenges for the next years, not only in operations and procedures, but also in assessment. So a further step must be applied for the observance of LHDs/LD, as just deliver LHD reports to SATMA (before 5th of month) appears not to be enough. It is essential that each State, naming/confirming a LHD Monitoring team Responsible, sends LHD reports with all fields fulfilled and detailed and, if any data is not available, investigates the deviation within the collateral or involved company.

2.2.2.6 The meeting was reminded of previous decisions regarding data collection including the need to improve the quality and reliability of the data they submit to SATMA by providing additional data on fleet capabilities including ADS-C/CPDLC connection and registration number, and provide correct addresses and update the contact information regularly to ensure timely submission of data and statistical analysis. Furthermore, the SATMA reiterated the need to ensure that the outcome of Safety Assessment that are based on the Collision Risk Model conducted for the EUR/SAM region is more representative of the prevalent risks, EUR/ SAM States/ANSPs are urged to provide all available information related to Large Height Deviations including their duration and causes to SATMA.

2.2.2.7 SATMA recalled an email it sent to focal points on 15<sup>th</sup> March 2016 to inform the relevant States/ANSPs that the “2016 EUR/SAM Corridor Safety Assessment will include traffic data regarding January to June 2016, and all year LHD and appealed for submission of data to cover the period, before end of July 2016. The meeting was urged to remember that DATA models to be sent are included in the document “DATA NEEDED FOR EUR/SAM MONITORING AND ASESSEMENTS” published in SATMA website.

The meeting formulated the following decision:

**DEC 21/01:                    *LHD Monitoring Team***

**That,**

**a) LHD Monitoring Team be reestablished with membership from EUR SAM Member States/ANSPs; and**

**b) EUR SAM States/ANSPs should nominate and provide contact details of monitoring members to SATMA by 30th September 2016, ensure that LHD reports are completed correctly and also, to ensure the data delivery schedule (annually every first 6 months ) for Safety Assessments in the EUR/SAM Corridor are met.**

**Agenda Item 2.2.3: EUR/SAM Corridor – Airspace Concept**

2.2.3.1 The meeting reviewed the implementation Action Plan of the EUR SAM Corridor Airspace Concept following its approval during the SAT/19 meeting in Buenos Aires, Argentina and endorsement at the SAT /20 meeting in Abidjan – Cotê d’ Ivoire. The meeting noted the constraints in the implementation which was mainly due to reassignment of experts who were spearheading the implementation of the plan. Nevertheless, it was noted that the delay had also provided an opportunity to review the action plan and to discuss the way forward having in mind the current information and some expected changes to the PANS-ATM Doc.4444.

2.2.3.2 The meeting recalled the outcome of the 38th ICAO General Assembly which approved the Global Air Navigation Plan for the period 2013- 2018 along with the Aviation System Block Upgrades (ASBU) which will enable aviation to realize global harmonization, capacity increase and reduction in the environmental impact that modern air traffic growth is currently demanding in every region around the world. In this regards, the PBN was selected as one of the main objectives to be complied with, in order to attain improvements in safety and efficiency.

2.2.3.3 The Group noted that advancements in aircraft avionics and air traffic management flight data processing systems have recently driven analysis of whether the lateral and longitudinal separation standards in the current EUR/SAM Corridor airspace could be reduced to increase the capacity and efficiency of the airspace. In accordance with the ICAO PANS ATM Doc 4444, the distance-based separation minima values are 50 NM longitudinal, 30 NM longitudinal, 50 NM lateral and 30 NM lateral, provided that a set of requirements are met or exceeded, which includes the requirement for aircraft to be authorized for RNP-10 or RNP-4, have direct pilot-controller voice communication or CPDLC and provide ADS-C position reports.

2.2.3.4 In reviewing the EUR SAM airspace concept action plan, the Group adopted a three-phased approach with implementation timelines is proposed as follows:

- Phase 1 - 50 NM Longitudinal Separation based on RNP10;
- Phase 2 - Data Link Mandate to apply 50 NM Longitudinal Separation based on RNP10
- Phase 3 - 30 NM Lateral / Longitudinal Separation based on RNP4

Furthermore, the Group adopted a revised EUR/SAM Corridor Airspace Concept Action Plan attached in **Appendix C2** and decided to establish a Task Force to facilitate implementation of the plan.

**Dec 21/02: EUR SAM Airspace Concept implementation Task Force**

**That,**

**a) An EUR SAM Airspace Concept implementation Task Force is established with Focal Points attached in Appendix C1 of this report; and**

**b) The Task Force to update the EUR SAM Airspace Concept implementation plan, list the activities to be completed, determine individual State/ANSPs requirements and agree on implementation timelines for each of the three phases.**

## **2.2.4 RNP 4 in the EUR/SAM Corridor EUR/SAM corridor airspace concept**

2.2.4.1 The “EUR/SAM corridor airspace concept plan”, as any long term plan, has been developed through initial considerations and hypothesis that have to be constantly monitored and evaluated. ENAIRE reminded the meeting that initial proposals regarding RNP4 implementation in the corridor appeared in 2009, during SAT14 (Cape Verde). The meeting considered that with seven (7) years delay in implementation, the airspace concept plan needed to be revised and updated.

2.2.4.2 ENAIRE recalled the discussions on RNP-4 during previous SAT meetings and outcomes. ENAIRE also analyzed the data collected annually by SATMA and reported by ENAIRE, noting that the general trend relative to FANS performance services since 2010 could be analyzed. It therefore submitted data and analysis of aircraft flying in the UIR Canarias from/to the EUR/SAM Corridor.

2.2.4.3 The main issues identified from this ENAIRE study are the following:

- The data considered only traffic overflying the Canarias UIR from/to EUR/SAM Corridor.
- Percentage of flights connected with FANS to the total number of flights in the EUR/SAM Corridor has decreased by almost a 10% from 61.37% to 52.85% in 5 years.
- Almost every FANS equipped flight was connected (95%), indicating FANS capability in the FP.
- The majority of logged-on flights exchanged CPDLC information (95%).
- No figures AVAILABLE about FANS equipped flights but did not logon.

2.2.4.4 The traffic flows along SANTA MARIA OCEANIC directly through SAL and Dakar FIRs or UR976/UA602 have been not considered. Thus, it may be a close estimation but not the actual global figure concerning fleet capabilities in the EUR/SAM Corridor.

2.2.4.5 The outcome of the study indicates a decreasing trend of traffic flow along the corridor, noting that this should be one of the facts to be considered in determining the course and future of RNP4 implementation in the EUR/SAM Corridor.

2.2.4.6 ENAIRE reminded the meeting of previous decision for Proposal for Amendment (PfA) of the Regional Supplementary Procedures, AFI (Doc 7030/9) as follows:

- “All concerned aircraft operating flights as general air traffic in accordance with instrument flight rules in the airspace defined below shall use controller-pilot data link communications (CPDLC) application, if the aircraft is properly equipped and hold an authorization, where applicable, either from the State of Registry or the State of the Operator.”
- “All concerned aircraft operating flights as general air traffic in accordance with instrument flight rules in the airspace defined below shall use Automatic Dependent Surveillance – Contract (ADS-C) application, if the aircraft is properly equipped and hold an authorization, where applicable, either from the State of Registry or the State of the Operator.”

2.2.4.7 ENAIRE observed that though PfA when implemented will positively contribute to safety, it is not expected to impact in FANS traffic statistics.

2.2.4.8 ENAIRE in its paper proposed the following actions for the implementation of the EUR/SAM Airspace Concept Action Plan:

**Phase 1: (50 NM Longitudinal Separation based RNP10)**

As the aim of Phase 1 is to provide a tactical application, when possible, regarding 50NM longitudinal separation, and to establish DCT segments for low demanding periods, it should be developed on a bilateral basis. As “tactical mode”, each State should conduct its own cost/benefits analysis, apply its internal Safety regulations requirements and coordinate LoAs with concerned stakeholders. In this regards, no global EUR/SAM specific Safety Study should be performed, noting that the new scenario will be reflected in the annual SATMA Safety Assessment accordingly.

**Phase 2: (50 NM Longitudinal Separation based on RNP10 -Data Link Mandate)**

Phase 2 implies a further step, as it proposes the establishment of preferential Flight Levels for FANS/1 equipped traffic, applying 50NM Longitudinal Separation above an agreed FL that will be defined. Phase 2 should only be started when Phase 1 conclusions are thoroughly analyzed, and the agreed FL structure should be defined based on objective results.

2.2.4.9 Furthermore, ENAIRE proposed the following actions to facilitate the implementation of the EUR/SAM Corridor Airspace Concept Action Plan:

- a) Review Phase I :
  - a. Eliminate: “Preliminary CRM Safety Assessment” from Project Deliverables.
  - b. Eliminate: “States must provide the needed data to perform the safety assessment” from Remarks.
  - c. Modification: Post-Implementation Monitoring of 50NM Longitudinal Separation (to be accomplished within general EUR/SAM Safety Assessment) from Project Deliverables.
- b) Review Phase II :
  - a. Modification: Preliminary Airspace Structure Delivery Date should be SAT22.
- c) Align the roadmap schedule of “EURSAM corridor new airspace concept plan” to traffic trends and to the actual usage of FANS.

After a comprehensive discussion of the agenda item, the following decisions were formulated:

**Dec 21/03:                    *EUR SAM Corridor Airspace Concept Action Plan***

**That,**

**A three-phased EURSAM Corridor Airspace Concept Implementation Action Plan is agreed as follows:**

**Phase One: 50 NM Longitudinal Separation based on RNP10;**  
**States/ANSPs consider establishing Direct Segments for low-demand periods on bilateral basis, conduct individual cost/benefits, apply its internal Safety regulations and coordinate signing of related LoAs;**

**Phase Two: Mandate Data Link application for implementation of 50 NM Longitudinal Separation based on RNP10; and**

**Phase Three: 30 NM Lateral / Longitudinal Separation based on RNP4.**

2.2.4.10 The meeting decided to establish a Task Force to identify needs, list the requirements and coordinate the implementation of the EUR/SAM airspace concept and drafted the following decision:

**Dec 21/04: *EUR SAM Airspace Concept implementation Task Force***

**That,**

**a) An EUR SAM Airspace Concept implementation Task Force is established with Focal Points attached in Appendix C1 of this report; and**

**b) The Task Force to update the EUR SAM Airspace Concept implementation plan, list the activities to be completed, determine individual State/ANSPs requirements and agree on implementation timelines for each of the three phases.**

2.2.4.11 The meeting recommended that representatives of State Civil Aviation Authorities should be included in the EUR/SAM Airspace Concept implementation task Force to facilitate the determination of regulatory approval requirements and processes.

**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 Cayenne ACC provided a feedback to the meeting concerning the implementation of a new night route scheme in its oceanic airspace since 4<sup>th</sup> February 2016. The meeting was informed of significant increase in capacity leading to improvement in the safe and efficient air traffic management.

2.3.1.2 The Cayenne upper airspace and with its oceanic component is served by the two primary routes, the UL695 and UL375. Apart from these routes, the airspace permitted Flexible Routing and allowed a random programming to the entry and exit points in the SOOO airspace. However, with implementation of the night routing, the flexibility use of airspace is no longer allowed.

2.3.1.3 The need to ensure that safety levels are maintained in the face of increasing traffic flow through the airspace has necessitated the need to propose an implementation of ATFM.

2.3.1.3 Senegal and other FIRs in the EUR/SAM corridor commended Cayenne for a well-coordinated airspace reorganization which has led to significant increase in capacity and efficiency, and urged for continuous collaboration among the FIRs. The meeting formulated the following decision:

**Dec 21/05: *Air Traffic Flow Management in the Cayenne FIR***

**That,**

**Considering the significant improvements achieved in the Cayenne FIR as a result of collaboration between Cayenne FIR and adjacent SAT FIRs, the team formalizes the cooperation by constituting an Air Traffic Flow Management team for flights across the FIRs to manage capacity.**

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**Agenda Item 2.3.2: Withdrawal of ILDIR to Resolve Coordination Failures**

2.3.2.1 South Africa highlighted on operational issues within its AORRA airspace and the resolutions taken to resolve the safety issues related to coordination failures at a Waypoint ILDIR which is located on a common boundary point Johannesburg, Luanda and Namibia.

2.3.2.2 During the Coordination meeting held in (Johannesburg, South Africa, 3-5 February 2015) it was discovered that the coordination failures were attributed to the misunderstanding of the coordination around ILDIR in the AORRA airspace.

2.3.2.3 Mostly it was unclear as to whether estimates for traffic routing southbound via ILDIR from Angola should be passed to Johannesburg Oceanic or Windhoek control.

2.3.2.4 During the PRND WG 5 meeting (Dakar, 17 to 20 February 2015), a resolution was reached by the 3 States involved (Angola, Namibia and South Africa) that ILDIR and its associated routes in the AORRA region should be withdrawn and new 5 LNC waypoints be implemented. The affected states were tasked to withdraw ATS routes within the AORRA airspace and in addition, to amend all LOP to reflect the changes as agreed, and the following waypoints (GUBAG, DIMIX and ODOTU) were established.

2.3.2.6 The target date of May 2015 was further reviewed to the 7th January 2016. To date South Africa has published the withdrawal of ILDIR and associated ATS routes within the AORRA; however no confirmation has been received from the other affected states about the implementation of these recommendations.

2.3.2.7 The SAT Group recalled previous accidents that had occurred due to similar situations, expressed concerns about the non-compliance with agreed solutions to the danger and urged all parties to address the safety risks in the AORRA airspace as a matter of urgency. The meeting therefore formulated the following conclusion:

**CON 21/06: *Implementation of AORRA airspace re-organization over ILDIR***

**That,**

**Considering the safety risk posed to flights operating in the AORRA airspace in Luanda, Johannesburg and Windhoek FIRs, ICAO ensures the agreements reached in respect of airspace re-organization of the position ILDIR be implemented as a matter of urgency.**

**Agenda Item 2.4: *ATM Contingency Plan for South Atlantic Oceanic FIRs***

2.4.1 The SAT Contingency Plan contains arrangements to ensure the continued safety of air navigation in the event of partially or total disruption of air traffic services (ATS) within the South Atlantic Oceanic Flight Information Regions.

2.4.2 The need for an ATM Contingency Plan is a requirement in ICAO Annex 11 paragraph 2.30 which stipulates, “that Air traffic services authorities shall develop and promulgate contingency plans for implementation in the event of disruption, or potential disruption, of air traffic services and related supporting services in the airspace for which they are responsible for the provision of such services. Such contingency plans shall be developed with the assistance of ICAO as necessary, in close coordination with

the air traffic services authorities responsible for the provision of services in adjacent portions of airspace and with airspace users concerned.”

2.4.3 Contingency plans may constitute a temporary deviation from the approved regional air navigation plans; such deviations are approved, as necessary, by the President of the ICAO Council on behalf of the Council.

2.4.4 Pursuant to the requirement in Annex 11, the SAT Group decided to collaborate towards the establishment of a coordinated ATM Contingency Plan with regards to the provision of ATS over the high seas. Consequently, South Africa was given the task of coordinating the development of the Contingency Plan; which it did and presented the draft to SAT/18.

2.4.5 The meeting recalled that SAT States/FIRs were tasked to review and send comments to South Africa for compilation and final adoption by the SAT Group. However, this action has been delayed due to reassignment of key personnel who were involved in the process. Subsequently, ASECNA with its rich experience in development, promulgation and implementation of ATM Contingency Plan was tasked by SAT 20 to partner South Africa in order to finalize the plan.

2.4.6 The SAT Group urged all SAT States/ANSPs to review the Contingency Plan and in particular consider the Flight Level Allocation System (FLAS) and Strategic Lateral Offset Procedures (SLOP) proposed in the plan. The meeting further reemphasized that the Contingency Plan for the SAT region must be harmonized with other national ATM Contingency Plans and ATS procedures, and urged States/ANSPs to send their feedback to South Africa by 30<sup>th</sup> September 2016. The meeting further urged SAT States/ANSPs to provide updates of their focal points to enable South Africa to facilitate coordination of the task. The SAT group formulated the following decisions:

**DEC 21/07: *Adoption of ATM Contingency planning for SAT region***

**That,**

- a) The updated Draft ATM Contingency Plan for the SAT region attached in Appendix F is adopted;**
- b) Focal Points of SAT States/ANSPs to review and submit their final comments to the Team Leaders namely, South Africa and ASECNA by 30<sup>th</sup> September 2016; and**
- c) Secretariat to submit final draft ATM Contingency Plan for the SAT region to the ICAO Council by 31<sup>st</sup> December 2016 for consideration and approval.**

**Agenda Item 2.5: Performance Based Navigation (PBN) in the South Atlantic**

**2.5.1: PBN Implementation in Cabo Verde**

2.5.1.1 Cape Verde presented a paper about PBN implementation in the country and recalled that ICAO adopted the Resolution A36-23 requiring Regions to complete PBN Implementation Plan by 2009 and ICAO Assembly Resolution A37-11 urges States to develop their own PBN implementation plan as a matter of urgency and is geared towards achieving the global PBN performance objectives. It further noted that implementation of global performance objectives are to be coordinated at the regional levels and aligned to be consistent with the ICAO Global ATM Operational Concept and Global Air Navigation Plan.

It further reiterated that geographical position of Cape Verde in the heart of the SAT region in the Atlantic Ocean makes it imperative to pursue collaboration with its neighbours.

2.5.1.2 Cape Verde noted that implementation of RNP-4 is part of the national PBN implementation plan and recalled that RNP-4 is currently considered as part of the proposed EUR/SAM corridor Airspace Concept, particularly so because RNP-4 is required for implementation of 30nm Lateral Separation. The implementation of RNP 4 by Cape Verde will be consistent with the decisions of SAT group for EUR/SAM corridor.

2.5.1.3 Cape Verde also reminded the SAT Group, particularly SATMA, that implementation of RNP 4 will need a safety assessment to be done by SATMA.

2.5.1.4 Cape Verde reported of its current challenges in RNP-4 approvals and recommended that it would be prudent for the SAT States to harmonize RNP-4 approvals process for the SAT region. The meeting commended Cape Verde for the initiative and agreed of the need for awareness seminars for the SAT States/ANSPs to gain better understanding and facilitate implementation of RNP in the in the EUR/SAM corridor. The meeting was informed about the maturity of RNP-4 implementation in other Oceanic airspaces including Canada, USA and United Kingdom and requested the Secretariat to arrange an awareness seminar or workshop for States/ANSPs in the SAT Group.

## 2.5.2 RNAV Training

2.5.2.1 ASECNA indicated its lack of capacity to provide training in the application of RNAV/RNP-4 Separation for air traffic controllers and solicited assistance from other ANSPs that have the capacity to assist. ASECNA further expressed concerns that some aircraft might be unable to operate PBN or RNAV routes and thus provide challenges for ATC to manage mixed-mode operations.

2.5.2.2 Portugal/ Santa Maria informed the meeting about its experience in the application of RNAV Separation over the Ocean and therefore requested to ASECNA to submit its needs for consideration.

The meeting therefore adopted the following decision:

**Dec 21/08:** *Training for application of RNAV/ RNP 4 Separation over the Oceanic Airspace and Regulatory Approval*

**That,**

**a) ASECNA shall conduct an identification of training needs for application of RNAV/RNP distance-based Separation and submit requests to NAV Portugal and ENAIRE (Spain) for consideration of assistance; and**

**b) ICAO liaises with the FAA and other ANSPs to arrange RNP 4 training and Regulatory Approval Process course for States/ANSPs.**

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**Agenda Item 2.6: Any Other Business**

**2.6.1: South Atlantic Region Working Structures**

2.6.1.1 IATA presented a paper that highlighted concerns with the SAT regional consolidated vision and made the proposal to change current regional strategy and working structures having an impact on harmonization, safety, airspace efficiency and aircraft operating in the region. IATA indicated that aircraft operators in the South Atlantic (SAT) Region consider there is a need for strategies which promote safety and operational efficiency, support safety management systems and aviation system block upgrades (ASBUs), as well as allowing other stakeholder benefits.

**2.6.1.2** IATA noted that the strategy needs to take into consideration:

- a) Formation of a strategy (SAT Region Commitment and Action Plan (SATCAP)) to ensure appropriate implementation and management of relevant ICAO ASBUs and regional priorities
- b) Identify areas where immediate attention is required to improve safety; and
- c) The implementation of immediate action to define the steps necessary to resolve long-term air traffic flow and airspace capacity issues.

2.6.1.3 IATA noted that operators recognize the resource challenges and economic constraints which some States and ANSPs cope with to provide air traffic services, however, they feel that sustainable strategies which would have long term effect on enhancing safety while integrating future concepts to improve airspace capacity and harmonize ATM components are sorely needed.

2.6.1.4 Airlines observations have indicated the lack of a clear and attainable regional coordinated vision, consistent improvement to the regional working structure, and alignment with the ICAO North Atlantic Region. Inappropriate funding for strong infrastructure is a contributing factor to slow resolution of problems impacting problem areas and implementation of relevant ICAO ASBUs. Further, airlines are concerned and have expressed their frustrations with respect to the utilization and implementation plan for CPDLC, mitigation plan for large height deviations, comprehensive plan to resolve EUR/SAM corridor safety and operational issues, strategic lateral offset procedures usage, as well as the dual ownership of published waypoints, among other issues, were reported as issues concern.

2.6.1.5 IATA compared the activities in the SAT region with those of the NAT region where several large-scale communications and operational initiatives have been implemented in the North Atlantic (NAT) region including, but not limited to the NAT data link mandate, RNP4, reduced longitudinal separation, reduced lateral separation, ground based ADS-B (Greenland, Iceland, Portugal), flexibility of ATC assignment of MACH, aircraft step climbs, and 30 NM lateral, 30 NM longitudinal and 50 NM longitudinal separation minima. These implementations require a high degree of planning, project management, cross-discipline skill sets, and collaboration of interested stakeholders.

2.6.1.6 Through the introduction of ICAO Aviation System Block Upgrade (ASBU) Modules a global ATM system is envisioned as the foundation of a worldwide integrated, harmonized and interoperable air transportation system. Such a system is intended to integrate regional and local ATM systems to interoperate and provide seamless services across all regions, sub-regions and States. The system will provide services to all users in all phases of flight. This globally interoperable system will meet requirements for safety and security and provide optimum economic operations that are environmentally sustainable and cost effective. It is essential for the SAT region to have a strong approach and adopt a consolidated vision that will support regional strategies while incorporating a new working methodology to ensure priority areas are appropriately progressed. The new working methodology would be utilized to:

- a) implement priority ICAO ASBUs, as appropriately identified;
- b) create specialized project teams to facilitate timely implementation of regional priorities;
- c) ensure appropriate level of intra and inter-regional coordination exist; and
- d) ensure efficient and cost effective implementation of regional priorities.

2.6.1.7 The paper recalled that recently, the NAT Strategic Planning Group (NAT SPG) underwent restructuring of its management model. The NAT SPG agreed to eliminate several contributory groups in order to mitigate duplicity of regional tasks and actions, take better advantage of multi-disciplinary skill sets, and advocate skilled personnel being members of appropriate project teams to achieve stronger adherence to regional timelines and implementations. The new working structure provides greater capability toward timely completion of regional tasks, simplifies terms of reference and project outcomes and supports coordination with stakeholders. In the estimation of some, the NAT ANSPs and provider States retain a plethora of skilled air traffic management and controller personnel and have already expressed their desire to assist adjacent regions by improving synchronization and coordination.

2.6.1.8 The proposal urged the SAT Group to discuss efficiency and capability of the current regional working structure and the ability to deliver timely implementation of ASBUs and priority initiatives; reach consensus on the development of “SATCAP Go Team” which will identify related projects from ASBU modules and the various SAT decisions/conclusions for implementation. The “SATCAP Go Team” shall consists of experts provided by states and concerned international organizations; and agree to develop a process to facilitate sustainable coordination with adjacent region ATM personnel having the requisite multi-disciplinary to reach established components of GANP and ASBUs.

2.6.1.9 The paper generated a lengthy discussion and there was a general consensus that on the need to take on-board the issues identified by operators and also for more effectiveness and efficiency in the work of the SAT Group. The meeting also acknowledged the studies done by IATA on the structure and working methodology of the SAT Group and proposals to learn from the experience of the NAT region. The meeting however was of the opinion that more studies was required on the proposed restructuring of the SAT Group and noted that collaboration with the NAT Group would be necessary to study the NAT concept, structures and methodology.

2.6.1.10 The meeting also noted that most of the States/ANSPs in the NAT region have advance systems, more resources and regional policy framework which helps to drive the implementation of regional programmes. The meeting noted the need for more cooperation with other States and ANSPs in the NAT region in order to gain a better insight of the setup, and therefore urged IATA and the FAA to assist by promoting the establishment of those collaborative working relationships.

2.6.1.12 IATA and the FAA noted the request and indicated their willingness to promote cooperation between the NAT and SAT Groups. IATA informed the meeting of an upcoming NAT meeting and recommended that the SAT States/ANSPs and ICAO WACAF and SAM regions to participate in order to start the collaborative process.

The meeting formulated the following decision:

**Dec 21/09: SAT Working Structure and collaboration with NAT region**

**That,**

**The SAT region collaborates with the NAT region in order to share working experiences, best practices, pool resources and harmonize operations for the benefit of airspace users and increase efficiency in the management of flights across the two regions.**

### **Agenda Item 2.6.3 Lack of contact by flights over Dakar oceanic airspace**

2.6.3.1 ASECNA presented a working paper which expressed some concerns related to the lack of contact by some flights over the South Atlantic Oceanic airspace. The paper noted that the South Atlantic is a wide remote oceanic airspace with currently no possibility of providing full VHF radio coverage. In this environment, ATCs rely on pilot position reports as means of separating traffic, this is obtained by monitoring with ADS/C-CPDLC and/or H.F. frequency contact. Lack of suitable HF or CPDLC, mainly by light and medium aircraft in lower airspace makes frequent the triggering of inadvertent emergency phases.

2.6.3.2 The paper pointed out that carriage of HF or CPDLC over this large expanse of South Atlantic Oceanic airspace is still not mandatory. A significant number of traffic comprising mainly light and medium aircraft, operate in the lower airspace between South America and West Africa, and in a number of cases, loose contact with ATC centres; thus triggering the activation of emergency phases.

2.6.3.3 The paper indicated that at least eight (08) incidents with the details listed below have been recorded since the beginning of 2016:

- OONFY E545 (SBRF/GVAC) on 04/01/2016,
- CCANS RJ85 (GVNP/SBSG) on 09/01/2016,
- MARS E190 (GVAC/TNCM) on 15/01/2016,
- IFA1073 LJ60 (GVAC/SBRF) on 31/01/2016,
- PRWYW FA50 (SBGL/GVNP) on 06/02/2016,
- PRGEK B737 (GVAC/SBCF) on 13/02/2016,
- CTM2011 C130 (SBFZ/GVNP) on 16/02/2016,
- S2AHH AT75 (SBSG/GVAC) on 25/02/2016,
- ECLRQ AT8T (SBRF/GVAC) on 22/04/2016
- IFA1320 CL60 (SBGR/GVNP) on 14/05/2016

2.6.3.4 These incidents oftentimes lead to activation of emergencies phases and mobilization of significant human and material resources which the concerned centres cannot always afford.

2.6.3.5 Such incidents are always reported to Senegal CAA which follows up each time, by notifying its counterparts in Cape Verde, Spain and Brazil.

2.6.3.6 ASECNA urged ICAO and other relevant organizations to consider the safety risks posed by those flights and mandate carriage of suitable means of communication in line with the airspace classification.

2.6.3.7 The SAT Group expressed grave concerns about the situation and recommended that action should be taken to address the risks.

The following conclusions were formulated:

**Con 21/10: *Safety Risk to flights due to lack of communications by flights over high seas***  
**That,**

**In consideration of the serious safety risks posed by flights which operate in the SAT region without contacting the appropriate ATS units:**

**a) ACCs in the SAT area are urged to increase the level of coordination and collaboration to reduce the risks;**

**b) Brazil, Cape Verde and Senegal compile and investigate deliberate violations of ATC procedures by such flights and inform the States of Registry for the aircraft concerned; and**

**c) Compile the number of aircraft involved in the violations above, perform the appropriate analysis, determine disposition of an emerging trend and inform the respective ICAO Regional Office of potential risk to flights operating on the high seas in the SAT region for necessary action.**

2.6.4 Space-Based ADS-B via Low Earth Orbiting Satellites– Concept and benefits for use in oceanic and remote air traffic management environments

2.6.4.1 Aireon presented a paper about description of the concepts for use of space-based ADS-B in the provision of Air Traffic Services in oceanic and remote locations and provided details on the planned use of the system which is currently under development in the ICAO North Atlantic Region.

2.6.4.2 The paper noted Air Traffic Management (ATM) improvements with regard to capacity and flexibility in oceanic Air Traffic Service (ATS) provision is hampered by the absence of ATS surveillance coverage. However recent developments in the deployment of Automatic Dependent Surveillance-Broadcast (ADS-B) receivers in space it will in the near-term be possible to apply separation standards based on ATS surveillance in oceanic areas.

2.6.4.3 The paper further noted that NAV CANADA and NATS (United Kingdom's primary ANSP) have developed an ATM concept for introducing new separation standards into the North Atlantic (NAT) based on space-based ADS-B. The ICAO Separation and Airspace Safety Panel (SASP) are developing new separation standards based on space-based ADS-B data. These new separations will be published in the Procedures for Air Navigation Services – Air Traffic Management (PANS-ATM; Doc 4444).

2.6.4.4 Iridium NEXT will provide global coverage, offering the possibility of monitoring ADS-B equipped aircraft anywhere in the world, augmenting the current ground-based ATS surveillance infrastructure. This will reduce the necessity to make potentially very costly investments to extend ATS surveillance coverage to oceanic, polar and other remote areas. It can also avoid costs that would be required to replace ground-based ATS surveillance systems, as they reach their end of service. The ability to provide ATS surveillance services would be an effective means for harmonizing ATS and supporting cost-effective improvements for safety and efficiency. This satellite space-based surveillance would be on a separate network from that supporting current FANS 1/A and equivalent Controller Pilot Data Link Communications (CPDLC) capabilities.

2.6.4.5 With the deployment of the Aireon service, real-time position updates will be available every 8 seconds or better for each equipped aircraft. This update rate would significantly improve situational awareness for air traffic controllers and provide for more timely conflict detection and resolution. The ability for air traffic controllers to provide advice and clearances during contingency and emergency situations would greatly improve. ADS-B information will be available to better detect, report and investigate aviation occurrences, improving Safety Management System (SMS) processes.

2.6.4.6 The paper recalled recent aviation tragedies such as the loss of AF 447 in the South Atlantic and MH 370 has highlighted a weakness in the aviation system pertaining to tracking aircraft in remote regions. The ICAO High Level Safety Conference endorsed the Global Aviation Distress Safety System (GADSS) during its meeting in Montreal in 2015, and new global standards for aircraft tracking are being

developed by ICAO. By 2018 aircraft operators will be required to account for the positions of aircraft in their fleet at intervals not exceeding every 15 minutes. By 2020 this requirement will be expanded to include a one-minute update interval for aircraft in distress situations.

2.6.4.7 The expected performance of space-based ADS-B meets these performance requirements by providing near real-time position updates for ADS-B equipped aircraft, whether or not they are in distress. Along with providing ANSPs with ATS surveillance data, Aireon will also deploy the Aireon Aircraft Locating and Emergency Response Tracking (ALERT) by 2018. Aireon ALERT is a free public service, hosted by the Irish Aviation Authority in Ballygirren, Ireland. Aireon ALERT will provide search and rescue entities and aviation stakeholders' access to position data of missing aircraft.

2.6.4.8 The meeting had an extensive discussion on the subject, noting the technical and infrastructure challenges, the maturity of standards and procedures and institutional challenges of implementing such backbone systems on regional basis. One of the critical considerations required to make informed decisions, particularly for a game-changing technology such as spaced-based ADS-B, is about cost. The meeting therefore requested Aireon to submit the different models of cost options for the SAT region, for consideration by the Group.

**Recommendation 21/11:**        *Consideration of Space-Based ADS-B in the SAT region*

**That,**

**Aireon submits different models of cost options for the SAT region, for consideration by the Group.**

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

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

3.1.1 Under this agenda item the meeting reviewed the conclusions and decisions of the SAT/20 meeting pertaining to CNS field as attached in **Appendix B2**. The meeting discussed in length on the issues of Missing Flight Plans experienced by SAT members and noted that conclusion 19/12 of SAT/20 meeting was not implemented by all members.

In particular the meeting identified ANSPs who have not yet established the multidisciplinary local missing Flight Plans investigation groups including airlines as called upon and agreed that as a matter of urgency the concerned SAT members should take the necessary action for the effective implementation of this conclusion. The following conclusion was formulated:

**Conclusion 21/12: *Establishment of multidisciplinary local Group for the assessment and the mitigation of missing Flight Plans***

**That;**

**SAT ACCs who have not yet done so namely, Luanda, Eizeza, Montevideo, Cayenne, Casablanca endeavor to establish as a matter of urgency but no later than 31 July 2016 the multidisciplinary local missing Flight Plans investigation groups as called upon by SAT Conclusion 20/12.**

3.1.2 The meeting also noted the need for SAT members to assess and to mitigate missing Flight Plans in an organized manner. The meeting agreed that SAT members should develop Work Programmes for the assessment and the mitigation of missing Flight Plans and regularly report on the status of implementation of these programmes. The following conclusion as formulated:

**Conclusion 21/13: *Development and implementation of Work Programmes for the assessment and the mitigation of missing Flight Plans***

**That;**

**SAT ACCs:**

- a) **Develop annual Programmes for the assessment and the mitigation of missing Flight Plans to be implemented by the multidisciplinary local Group.**
- b) **Report quaternary to SAT current coordinator with copy to the Secretariat, the result of the investigation and mitigation of missing Flight Plans**

3.1.3 In order to make effective the mitigation actions, the meeting tasked the Secretariat to summarize and forward to members, as reminder, SAT previous meeting Conclusions and Decisions related to missing flight Plans, develop a follow up table on the establishment of the multidisciplinary local Group with focal points and coordinate through E-Mailing and teleconferences the mitigation activities. The following Decision was formulated:

**Decision 21/14: *Follow up of the mitigation actions of missing Flight Plans***

**That;**

**SAT Secretariat:**

- a) **Summarize and forward SAT previous meeting Conclusions and Decisions related to missing flight Plans;**
- b) **Develop and circulate for update a table on the status of establishment by SAT ACCs of their multidisciplinary local Group with focal points;**
- c) **Coordinate follow up through E-mailing and teleconferences the status of implementation of the annual programme for the assessment and mitigation of missing Flight Plans**
- d) **Convey the first teleconference no later than 30 September 2016**

**3.2 Revue of the performance of SAT CNS Infrastructure and systems**

3.2.1 The meeting was provided with initiatives taken by ANSPs in order to stabilize the link between the server of the ACC and the host of the data link Communication Service Provider.

3.2.2 As an example ASECNA reported on the IP Gateway project currently at the aim to increase the availability and carry out deficiencies experienced in the operation of the data link in support to ADS/CPDLC applications. In this regards three HUBs (Dakar, Abidjan and Fuchsstadt) are set up and connected to the SITA POP, to provide data from the HUBs to the remotes ATM systems (TOP SKY) by passing the local Communication Service providers that are not able to ensure the desired availability of the leased lines.

3.2.3 The meeting applauded the initiative and encouraged Sat members to take benefit of the existing Satellite based VSAT Networks in order to improve the availability of the Air/Ground data link. The following decision was formulated:

**Decision 21/15: *Improvement of the availability of air/ground data link in support to FANS/I (ADS-C/CPDLC) operation***

**That;**

SAT ACCs take benefit of the existing satellite based aeronautical Networks (AFISNET, CAFSAT, SADC/2, REDIG II and MEVAIII) to improve the availability of the air/ground data link through the conclusion of appropriate technical arrangements with their Communication Service Providers (ARINC, SITA).

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

**3.3.1** The Secretariat summarized for the attention of the meeting the status of implementation of AMHS in the SAT Centers as presented at **Appendix H**.

The meeting noted progress made in the implementation of AMHS in the AFI and SAM regions and identified Argentina, Brazil, Senegal and South Africa for the establishment of transcontinental AMHS connection and encouraged the identified Centers to nominate AMHS interconnection focal points and initiate with the assistance of SAT Secretariat (ICAO Regional Offices Lima and Dakar) the elaboration of a study for the interconnection of their AMHS systems in accordance with the AFI and SAM regional ATN routing tables. The following Conclusion was formulated

#### **Conclusion 21/16: *Interconnection of AMHS systems between AFI and SAM Regions***

**That;**

**In order to implement the AMHS circuits between Buenos Aires and Johannesburg, Recife and Dakar, Argentina, Brazil, Senegal and South Africa:**

- a) 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**
- b) Organize in this respect a monthly AMHS focal points teleconference with secretariat (ICAO Regional Offices Lima and Dakar) to follow up the progress, with the first teleconference starting on 4<sup>th</sup> August 2016**

**3.3.2** The meeting reviewed the status of implementation of AIDC in SAT Centers as summarized in **Appendix I** and noted that the operation of AIDC will contribute to the improvement of air navigation safety as well as provide tangible benefits to air traffic control operation.

The meeting noted that a continuous coordination should be initiated and maintained in order to successfully implement AIDC amongst SAT ATCs and identified Angola, Argentina, Brazil, Côte d'Ivoire, French Guyana, Senegal, South Africa and Uruguay to nominate focal points and organize teleconferences with the Assistance of the SAT Secretariat in order to study the implementation of AIDC.

The following conclusion was formulated:

#### **Conclusion 21/17: *Implementation of AIDC***

**That;**

- a) Angola, Argentina, Brazil, Cote d'Ivoire, France Guyana, Senegal, South Africa and Uruguay conduct monthly if required teleconferences starting on 31st August of 2016 with the AIDC focal points and the SAT Secretariat, in order to study the implementation of AIDC interconnection between the AFI and SAM Regions.**
- b) ICAO Regional Offices Lima and Dakar coordinate through teleconferences the follow up of the implementation and interconnection of AIDC systems**

**3.3.3** ASECNA reported to have implemented for trials an ADS-B station in Dakar and informed the meeting that many aircrafts from various airlines (*Mauritania Airways, Air Côte d'Ivoire, Ethiopian*

*Airways, Asky, Royal Air Maroc, Tunisair, Arik, South Africa Airways, Air France, Delta Airlines, Brussels Airline, Air Portugal, Iberia, Lufthansa, Alitalia, Corsair Brithish Airways, Air Europa, Air Argentina*) are currently regularly and successfully able to exchange data through the system for the operation of which safety studies were conducted and submitted to the CAA for final approval before operational use. ASECNA also informed the meeting on its intention to extend the implementation of ADS-B with the station installed in Nouakchott with possible data sharing to Dakar ACC.

**3.3.4** The Ghana Civil Aviation Authority reminded the meeting on the resolution by the ITU 2015 World Radio Communication Conference (WRC-15) to allocate and protect on a primary basis the band 1090 MHz for spaced based ADS-B receivers for Aircraft to Satellite communication.

The meeting was also updated by AIREON on the evolution of the technology under development to address airspace based ADS-B for civil aviation as well as real time Global Flight Tracking.

The meeting applauded these initiatives and recognized the necessity for SAT members to follow up the development of ADS-B based surveillance capability and consider ADS-B space as an emerging technology candidate to complement the existing surveillance systems. The following conclusion was formulated/

**Conclusion 21/18:**     *Follow up of the progress in ADS-B Space*

**That;**

**In the framework of the future development of surveillance capability SAT ANSPs consider ADS-B space as an emerging technology candidate to complement the existing surveillance systems and an enabler for the development of aircraft Global Flight Tracking and follow up of the progress in the development of ADS-B Space .**

### **3.4     Any other CNS business**

**3.4.1** The meeting noted that air ground data link issues in particular CPDLC issues were discussed in the SAT FANS Interoperability Team (SAT/FIT) held in parallel with the CAFSAT Network Management committee (CNMC). It appeared that technical issues raised in the SAT/FIT meeting could not be properly addressed by the SAT CNS WG.

**3.4.2** The meeting agreed to task the CNMC to include in its agenda, items to address CNS issues such as those raised by the FANS Central FANS Reporting Agency (CFRA), in order to support FIT in the assessment of the data link.

The following Decision was formulated:

**Decision 21/19:**     *Amendment to CNMC Agenda*

**That;**

**The agenda of the CAFSAT Management Committee (CNMC) be amended to include items to address CNS issues such as those raised by the FANS Central FANS Reporting Agency (CFRA), in order to support FIT in the assessment of the data link.**

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).**

The SAT Group reviewed the conclusions/decisions of the SAT FIT/11 meeting held from 6 to 7 June 2016. The SAT FIT/11 adopted six (06) Conclusions and four (04) Decisions that were endorsed by the meeting. The Conclusions and Decisions of SAT FIT/11 are attached in **Appendix G1**.

**Decision 21/20: Adoption of the conclusion/decision of SAT FANS 1/A Interoperability Team (SAT/FIT/11).**

**That;**

**The Conclusions and Decisions of SAT FANS 1/A Interoperability Team are adopted as attached at APPENDIX G1.**

#### **4.2 Review of the Conclusions/Decisions of CNMC/6 meeting**

4.2.1 The meeting reviewed the conclusions/decisions of CNMC/ 6 meeting held from 6 to 7 June 2016. CNM/6 formulated eleven (10) draft Conclusions and three (04) draft Decisions that were endorsed by the meeting. The Conclusion and Decisions of CNMC/6 are attached at **Appendix G2**.

The following Decision was formulated:

**Decision 21/21: Adoption of the Conclusions/Decisions of CNMC sixth Meeting**

**That;**

**The Conclusions and Decisions of the CAFSAT Network Management Committee (CNMC) are adopted as attached at Appendix G2.**

#### **Agenda Item 5: Adoption of the C/Decisions of the SAT/21 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 J** to this report;

The following decision was formulated:

**Decision 21/22: 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 J**

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**Agenda Item 7: Any other business (Plenary session)**

7.1 The meeting examine the issue related to the future date and venue of SATFIT/12, CNMC/7 and SAT/221 meetings. French Guyana kindly offered to host these events. The meeting expressed its gratitude to France and tasked the Secretariat (ICAO Regional WACAF Office) to finalize with France Guyana the date and venue and inform the SAT Group as soon as possible.

7.2 The meeting expressed its gratitude to Portugal government, Portugal CAA and NAV Portugal for the hospitality, friendly welcome and assistance provided to all the participants during their stay in Lisbon.

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