AFI PLANNING AND IMPLEMENTATION REGIONAL GROUP
NINETEENTH MEETING (APIRG/19)
Dakar, Senegal (28 – 31 October 2013)

Agenda Item 3: Performance Framework for Regional Air Navigation Planning and Implementation

3.4 Communications, Navigation and Surveillance (CNS)

REPORT OF THE FIFTH MEETING OF CNS SUB-GROUP COMMUNICATIONS SYSTEMS:

ISSUES RELATED TO VERY SMALL APERTURE TERMINAL (VSAT) NETWORKS AND DEVELOPMENT OF AN INTEGRATED REGIONAL TELECOMMUNICATION INFRASTRUCTURE

(Presented by the Secretariat)

SUMMARY	
This working paper presents the report of the Fifth Meeting of APIRG Communications, Navigation and Surveillance Sub-group (CNS/SG/5, Nairobi, Kenya, 16-19 September 2013) on issues related to aeronautical VSAT networks (AFISNET, CAFSAT, NAFISAT and SADC VSAT)1 and the development of an integrated telecommunication infrastructure in the AFI Region.	
Action by the meeting is at Paragraph 3.	
REFERENCES : • ICAO SP AFI RAN 2008, Report (Doc 9930) • APIRG/18, Report	
Strategic Objective(s:	This working paper relates to the Strategic Objectives A and C

1. INTRODUCTION

1.1 The Fifth Meeting of the APIRG Communications, Navigation and Surveillance (CNS) Sub-group (Nairobi, Kenya, 16-19 September 2013) reviewed the report of the First Meeting of the APIRG Integrated Regional Telecommunication Infrastructure Task Force (IRTI/TF/1), which was held in Pretoria, South Africa, from 26 to 28 June 2013, at the kind invitation of the Air Traffic and Navigation Services Company of South Africa (ATNS). The IRTI/TF/1 meeting was attended by 56 participants from 18 ICAO Contracting States and 3 international organizations and 1 representative from the industry.

1.2 The main objective of the meeting was to pursue the work done by the AFI Aeronautical VSAT Networks Managers towards the development of an AFI integrated aeronautical telecommunication infrastructure, in accordance with APIRG/18 Decision 18/28 – *Establishment of a Task Force on the AFI Aeronautical VSAT Networks Regional Project*.

1.3 Issues related to aeronautical VSAT networks and the development of an integrated telecommunication infrastructure in the AFI Region was discussed.

1 AFISNET: AFI Satellite Telecommunication Network; CAFSAT: Central Atlantic Flight Information Regions Satellite Network; NAFISAT: Northern-Eastern AFI Satellite Network; SADC VSAT: Southern African Development Community VSAT Network.

2. DISCUSSION

Implementation of Best Practices for VSAT Networks

2.1 The CNS Sub-Group reviewed the status of implementation of the following best practices for aeronautical VSAT networks, as adopted by APIRG/18 Meeting:

Sustainability of VSAT Networks

2.1.1 The CNS Sub-Group recalled that APIRG/18 Meeting had urged the SADC VSAT/2 and NAFISAT networks participating States and the Network Provider (Air Traffic and Navigation Services of South Africa and IATA) to establish administrative and funding arrangements in a timely manner in order to ensure continuity of supported services (APIRG/18 Conclusion 18/27 refers), mindful of the anticipated termination of the related funding arrangements in 2014 and 2015.

2..1.2 The CNS Sub-Group noted with satisfaction that the concerned States had taken the necessary steps to ensure the sustainability of these two networks through seven year-extension of existing arrangements from the initial termination dates. The arrangement for SADC VSAT/2 had been finalized within the South African Development Community (SADC) institutional framework, whereas the NAFISAT Supervisory Committee had established a Study to develop consequential amendments to the NAFISAT Memorandum of Understanding to be endorsed by the concerned States during the first quarter of 2014.

2.1.3 The CNS Sub-Group noted the launch in 2013 of a project on the audit and re-engineering AFISNET network under the coordination of ICAO. Similarly, a Joint Technical Team was established in 2013 to develop proposals for the modernization and re-engineering of the CAFSAT network.

Space Segment Contingency Plan

2.1.4 The CNS Sub-Group noted that AFI VSAT Networks Managers had initiated consultations with Intelsat to explore available solutions to meet the requirement for a contingency plan for the space segment of aeronautical satellite communications. In this connection, Intelsat attended the first meeting of the IRTI Task Force and provided comprehensive information on civil aviation satellite capacity usage, challenges, C-band (3.4-4.2 GHz) spectrum risks and protection, Intelsat global infrastructure and Intelsat new generation satellites.

AFS Performance Monitoring and Reporting

2.1.5 The CNS Sub-Group recalled that APIRG/18 Meeting had agreed to a four level approach to AFS performance monitoring and reporting (including the space segment, radiofrequency equipment, multiplexers/interfaces and end user equipment), and endorsed Performance Data Collection Forms (PDCFs) for use by States. The CNS Sub-Group was informed that these forms were further reviewed by States through AFISNET, CAFSAT, NAFISAT and SADC VSAT coordination meetings, and therefore requested the Secretariat to finalize and circulate them to the States for implementation as from 1st January 2014. The CNS Sub-Group also agreed that the use of PDCFs by the States should be part of the best practices for AFS performance monitoring and reporting. The following draft decision and draft conclusion was formulated:

DRAFT DECISION 19/XX: IMPLEMENTATION OF PERFORMANCE DATA COLLECTION FORMS

That the best practices adopted by APIRG for Aeronautical Fixed Services (AFS) be amended to include the Performance Data Collection Forms (PDCFs) shown at Appendix 3.4A to this working paper.

DRAFT CONCLUSION 19/XX: HARMONIZATION OF THE COLLECTION OF THE STATISTICS ON THE PERFORMANCE OF THE VSAT NETWORKS

That as from 1 January 2014, in order to harmonize the monitoring, collection and reporting of technical and operational data on Aeronautical Fixed Services (AFS) characteristics and performance, States should:

a) Apply the four-level assessment model including space segment, radiofrequency equipment, modulators/demodulators, end-user equipment; and
b) use the software tools available in their processing systems to increase accuracy of the reported data, and facilitate comparative analysis of these data.

ATN developments in the AFI and SAM Regions

2.2 The CNS Sub-Group noted ASECNA plans to implement ATS Message Handling Systems (AMHS) in ten (10) operated centres: Dakar, Brazzaville, Niamey, Ndjamena, Antananarivo, Cotonou, Lome, Ouagadougou, Bamako and Nouakchott, and at their Training Centre (EAMAC) located in Niamey.

2.3 The CNS Sub-Group also noted the implementation by Ethiopia of an ATS Message Handling System (AMHS) in Addis Ababa, meeting the performance criteria established for AFI ATN backbone centres. Ethiopia has also equipped its CAA Training Centre with an AMHS facility. The Task Force had agreed to develop an amendment proposal to the AFI ATN Architecture by including Johannesburg, Addis Ababa and Cairo as trunk backbone routes.

2.4 In line with APIRG/18 recommendation to monitor and take advantage of lessons learnt by other ICAO regions' experience in implementing integrated regional communications networks, the CNS Sub-Group noted the information provided by France (DGCA) on the South American (SAM) Region project to implement an aeronautical Internet Protocol (IP)-based VSAT network, and recognized the importance of timely consideration of issues related to system safety, security appropriate technologies and system management.

Integrated Regional Telecommunication Network Project

2.5 The CNS Sub-Group reviewed the activities undertaken by the IRTI Task Force towards the development of an integrated telecommunication infrastructure for the AFI Region, in accordance with its terms of reference.

Technical Aspects

2.5.1 The IRTI Task Force revisited the work completed by the AFI VSAT Networks Managers between 2011 and 2012, including the design of an initial ATN overlay architecture based on existing networks (AFISNET, CAFSAT, NAFISAT and SADC VSAT/2), the development of a technical solution for the overlay network and the determination of related cost estimates. The work of the AFI VSAT Networks Managers was adopted by the APIRG/18 meeting in March 2012. The fundamental criteria underlying the initial technical solution included the following:

a) all four networks have made substantial investment in existing infrastructure, which must be retained and utilized;
b) three of the four networks operate on the same satellite i.e. IS 1002 which will ensure seamless operation;
c) a single satellite access method is proposed for the technical solution to ensure interoperability;
d) although the ATN network will mainly support IP based applications, legacy protocols must continue to be supported; and
e) the overlay network must be secured.

2.5.2 The Task Force agreed to review the AFI ATN Architecture Plan adopted by the APIRG/18 Meeting, and developed an Action Plan taking into consideration latest developments related to ATN, including:

a) ICAO Standards and Recommended Practices (SARPs) contained in Annex 10, Volumes II and III;

b) relevant guidance material in ICAO Doc 9880 (Manual on Detailed Technical Specifications for the ATN using ISO/OSI Standards and Protocols) and Doc 9896 (Manual on the ATN using Internet Protocol Suite (IPS) Standards and Protocols);

c) ICAO Aviation System Block Upgrades (ASBUs) and supporting Technology Roadmaps for Communications, Navigation and Surveillance (CNS), Information Management (IM) and Avionics;

d) alignment of regional air navigation plans (ANPs) and regional supplementary procedures (SUPPs) in accordance with Recommendation 6/11 of the ICAO Twelfth Air Navigation Conference; and

e) status of implementation by States of the ATN infrastructure and supported applications.

2.5.3 The CNS Sub-Group endorsed the Action Plan developed by the Task Force as shown in **Appendix 3.4B** to this working paper.

Administrative Aspects

2.5.4 The CNS Sub-Group reviewed the IRTI Task Force work concerning the oversight model, States' commitment, legal and governance issues, and noted the administrative and legal principles adopted by the Task Force which are provided as **Appendix 3.4C** to this working paper.

Financial Aspects

2.5.5 The CNS Sub-Group recognized that the development of the integrated regional telecommunication infrastructure project was still pursued by the IRTI Task Force, and that the cost estimates for the project will depend on the IRTI Task Force recommendations concerning the technical solution for the required integration of existing VSAT networks, including maintenance strategies. The initial cost estimates are provided in **Appendix 3.4B** to this working paper (Table 1).

Future work programme of the Task Force

2.6 The CNS Sub-Group agreed that the activities related to the development of an integrated regional telecommunication infrastructure should be pursued based on the Action Plan and the recommendations developed by the IRTI Task Force as endorsed by the CNS Sub-Group. It accordingly reviewed and proposed amendments to the terms of reference, work programme and composition of the IRTI Task Force as shown at **Appendix 3.4D** to this working paper. The following draft decision was formulated:

DRAFT DECISION 19/XX: TERMS OF REFERENCE, FUTURE WORK PROGRAMME AND COMPOSITION OF THE IRTI TASK FORCE

That:

a) the activities related to the development of an integrated regional telecommunication infrastructure should be pursued based on the Action Plan shown at Appendix 3.4B to this working paper; and

b) the terms of reference, future work programme and composition of the IRTI Task Force be amended as proposed in Appendix 3.4D to this working paper.

Planning and Implementation of ATN applications

2.7 The Sub-Group recognized that issues related to the ATN and supported applications (such as AMHS, CPDLC, ADS)2 were being dealt with by different bodies without proper coordination among them, while other applications (AIDC, VoIP)3 were not assigned to existing bodies. The following draft decision was formulated:

DRAFT DECISION 19/XX: PLANNING AND IMPLEMENTATION OF ATN APPLICATIONS

That:

a) The CNS Sub-Group should address all aspects of the planning and implementation of the Aeronautical Telecommunication Network (ATN) applications including ATS ground-ground and air-ground data link applications, in order to ensure systems interoperability through a coordinated and harmonized framework; and

b) **The Secretariat should accordingly develop proposals for a revised organizational structure to be considered by APIRG/19.**

2.8 In view of the above, the Secretariat further assessed the opportunity for revising the current organizational structure of CNS related auxiliary bodies of the APIRG, and would like to recommend the status quo, with the understanding that the issues not assigned to existing task force and the required coordination should be addressed at the level of the CNS Sub-Group.

3. CONCLUSION

3.1 The meeting is invited to:

a) review and endorse the report of the First Meeting of the Integrated Regional Telecommunication Infrastructure (IRTI/TF/1) as presented in this working paper;
b) discuss and adopt the draft conclusions and draft decisions proposed in this working paper;
c) request the IRTI Task Force to complete its assigned work and submit a consolidated project document to the Secretary of the APIRG by 30 March 2014, and
d) request the ICAO Secretariat, upon reception of the integration project document, to initiate the necessary coordination with AFCAC and other relevant regional/international institutions, in order to explore and identify possible sources of funding for the project.

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2 AMHS: ATS Message Handling System; CPDLC: Controller-Pilot Data Link Communications; ADS: Automatic Dependent Surveillance.
3 AIDC: ATS Inter-facility Data Communications; VoIP: Voice over Internet Protocol.

APPENDIX 3.4A

AERONAUTICAL FIXED SERVICES
PERFORMANCE DATA COLLECTION FORMS

EXPLANATORY NOTES

1: Performance of AFTN
Column 1: Country name
Columns 2 and 3: Terminal stations of individual links
Column 4: Network supporting the link
Column 5: Circuit communication protocol
Column 6: Circuit signaling speed
Column 7: Transit time between Terminal I and Terminal II
Column 8: Direct circuit or routed circuit between Terminal I and Terminal II
Columns 9-14: Monthly availability rates for six months
Column 15: Average availability rate for six months

2: Qualitative performance of ATS/DS
Column 1: Country name
Columns 2 and 3: Terminal stations of individual circuits
Column 4: Network supporting the link
Column 5: Connection time
Column 6: Number of attempts
Column 7: One way latency time
Column 8: Call set up time
Column 9: Qualitative assessment from 1 to 5 indicating voice strength and clarity
Columns 10-15: Monthly availability rates for six months
Column 16: Average availability rate for six months

3: Qualitative performance of ATN applications
Column 1: Country name
Columns 2 and 3: Terminal stations of individual links
Column 4: Network supporting the link
Column 5: ATN application
Column 6: Circuit communication protocol
Column 7: Circuit speed
Column 8: Transit time between Terminal I and Terminal II
Column 9: Routing indicates direct circuit or routed circuit between Terminal I and Terminal II
Columns 10-15: Monthly availability rates for six months)
Column 16: Average availability rate for six months

APPENDIX 3.4A

AERONAUTICAL FIXED SERVICES
PERFORMANCE DATA COLLECTION FORMS

Centre:

Date:

Parameters	Values
Fixed Parameters	
Intelsat link Name	IS 10-02 @ 359 Degrees East
Transponder Number	23/23
Satellite Earth Station Coordinates (WGS-84)	LONG = ddd, mm E/W LAT = dd, mm N/S
	AZ = ddd, mm E/W EL = dd, mm N/S
Antenna Type and Size	….m
Antenna Gain	Tx : … dBi Rx : … dBi
SSPA type	X W
Up Converter Frequency	MHz
Down Converter Frequency	MHz
Dynamic parameters	
EIRP	
G/T	
C/N0	
BER	
MTBF	
MTTR	
Parameters for Carrier Performance	
Carrier failure rate	
C/N0	
BER	

APPENDIX 3.4A

1: PERFORMANCE OF AFTN

Centre : Addis Ababa
Date:

Country	Ter-minal I	Ter-minal II	Sup-port	COM Proto-col	Speed	Tran-sit Time	Rou-ting	Monthly Availability 2013												½ Annual Ave-rage Avail a-bility Rate	
1	2	3	4	5	6	7	8	9		10		11		12		13		14		15	
								01		02		03		04		05		06			
Ethio-pia	Addis Ababa	Nairobi	NAFI-SAT					TX	RX	TX	RX	TX	RX	TX	RX	TX	RX	TX	RX	TX	RX

2: QUALITATIVE PERFORMANCE OF ATS/DS

Centre : Addis Ababa
Date:

Country	**Terminal I**	**Terminal II**	**Support**	**Con-nexion Time**	**Number of Attempts**	**One Way Latence Time**	**Call set up time**	**Voice Quality (1 to 5)**	**Monthly Availability 2013**						**½ Annual Ave-rage Availa-bility Rate**
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ethio-pia	Addis Ababa	Khar-toum	NAFI-SAT						01	02	03	04	05	06	

3: QUALITATIVE PERFORMANCE OF ATN APPLICATIONS

Country	**Terminal 1**	**Terminal II**	**Support**	**Provi-ded Service**	**COM Protocol**	**Speed**	**Transit Time**	**Routing**	**Monthly Availability 2014**						**Remarks**
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
									05	06	07	08	09	10	
Ethiopia	Addis Ababa	Moga-dishu	NAFI-SAT	AIDC											
Ethiopia	Addis Ababa	Djiboutii	NAFI-SAT	AMHS											

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APPENDIX 3.4B

INTEGRATED REGIONAL TELECOMMUNICATION INFRASTRUCTURE PROJECT

TECHNICAL ASPECTS

1) Background of Work completed by the Technical Group of the AFI Aeronautical VSAT Managers (Douala, Cameroon, 28 February – 01 March 2012)

a) Design of ATN Overlay Architecture:
   i) Based on the architecture design of original ATN Task Force
   ii) Circuits were inserted to ensure at least two interconnections between adjacent networks
   iii) Additional circuits included to provide further redundancy
   iv) The results are shown in Appendix 3.4H to APIRG/18 report.

b) The technical solution for the ATN overlay network was based on the following fundamental criteria:
   i) All four networks (AFISNET, CAFSAT, SADC, and NAFISAT) have made substantial investment in existing infrastructure, which must be retained and utilized.
   ii) Three of the networks operate on the same satellite i.e. IS 1002 which will ensure seamless operation
   iii) A single satellite access method is proposed for the technical solution to ensure interoperability
   iv) Although the ATN network will mainly support IP based applications, legacy protocols must continue to be supported
   v) The overlay network must be secure, i.e. independent of terrestrial services, etc.

c) The cost estimates calculated by the Technical Group are therefore based on the above criteria. The cost furthermore include the following line items:
   i) RF Outdoor Equipment (SSPA where required)
   ii) Indoor Unit
   iii) Modem/Frame Relay Access Device
   iv) Equipment Rack and Miscellaneous
   v) Un-interrupted Power Supply (UPS)
   vi) Spare Equipment
   vii) Site Installation, Integration and Commissioning
   viii) Engineering, Project Management and Training
   ix) Packing, Freight and Insurance
   x) Duties and Taxes

d) The cost estimates of the proposed solution are shown in the table 1 below: The estimates are based on the following spares options:
   i) Option 1: Total centralized maintenance, i.e. one set per network
   ii) Option 2: Total decentralized maintenance, i.e. one set per VSAT node
   iii) Option 3: Hybrid consisting of:
      (1) Decentralised maintenance for CAFSAT & NAFISAT
      (2) Centralized maintenance for SADC and NAFISAT
   iv) Table 1 below is a summary of the initial cost calculations for the AFI ATN overlay network

Table 1

Cost Comparison of VSAT Solutions for an AFI ATN Network - IDU in 1 + 1 Configuration					
Region -->	NAFISAT Region	SADC Region	AFISNET Region	CAFSAT Region	Total Cost for AFI ATN Network
Excluding Spares Options					
Option D (TDMA) IDU7000	$ 560,685.91	$ 610,341.82	$ 631,273.03	$ 604,376.50	**$ 2,406,677.26**
Including Option 1 Spares					
Option D (TDMA) IDU7000	$ 583,615.91	$ 671,671.82	$ 692,603.03	$ 627,306.50	**$ 2,575,197.26**
Including Option 2 Spares					
Option D (TDMA) IDU7000	$ 755,865.91	$ 920,721.82	$ 1,016,313.03	$ 767,026.50	**$ 3,459,927.26**
Including Option 3 Spares					
Option D (TDMA) IDU7000	$ 593,215.91	$ 662,071.82	$ 1,016,313.03	$ 767,026.50	**$ 3,038,627.26**

2) Way Forward of Technical Group of Integrated Regional Telecommunication Infrastructure Task Force

The following topics must be addressed by the Technical Group and timelines proposed:

a) Revise and Provide input to Financial and Administrative Groups:
   i) Revisit the calculations shown in table 4.1 above, done for the recommended technical solution, as well as costing for the maintenance options, and submit to Financial & Administrative groups – Target date: **August 2013**

b) Revision of the AFI ATN routing architecture
   i) The AFI ATN routing architecture must be revised to include circuits between Addis Ababa and Cairo/Johannesburg. As part of the process ATNS will discuss the implementation of the AMHS circuits and the conducting of trials with Eritrea
   ii) Revise the AFI ATN architecture, taking into account the re-alignment of the NAFISAT ANPs and SUPPs to the EUR and MID Regions – **ongoing**

c) Complete work in respect of maintenance options
   i) This is still not completed and will be addressed by Technical Group – Target date: **November 2013**

d) Review and update the status of implementation of the best practices as adopted by the APIRG/18 Meeting
   i) Initial analyses to be revisited by the Technical Group and report drafted – Target date: **November 2013**

e) Conduct a gap analysis against agreed best practices for networks
   i) Initial analyses to be revisited by Technical Group and a report drafted
   ii) Backup of satellite services: Technical discussions to be conducted with Intelsat to finalise calculations of backup options. It is foreseen that additional cost will have to be incurred that is not included in the initial cost calculation for the ATN Overlay – Target Date: **November 2013**

f) Develop a convergence plan with priorities and timelines to close identified gaps & other work for technical group

i) Align timelines with the timelines proposed in the AMHS Task Force:

(1) 2012 to 2014 – National deployment – domestic AMHS

(2) 2013 – 2015 - Regional deployment – AFI States will implement MTA to MTA, AMHS connections using TCP/IP via established AFI networks

(3) 2014 – 2018 – Inter-regional deployment – ATN/IPS connections

g) Alignment of Regional Air Navigation Plans & Supplementary Procedures:

i) Analyse the possible impact of the alignment of ANPs and SUPPs on its work

ii) Agree on the way forward for the development of an integrated regional telecommunication infrastructure for the Africa-Indian Ocean Region:

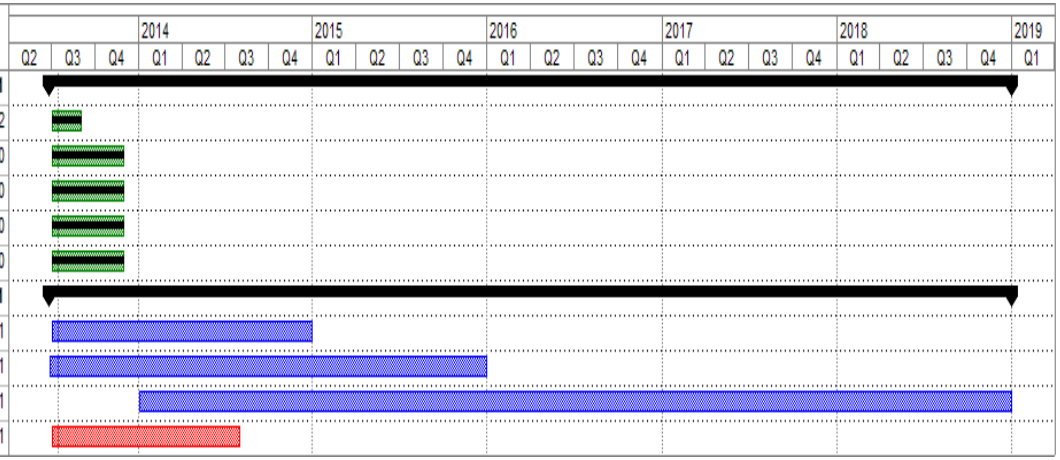
iii) Amendment proposal for AFI Regional Air Navigation Plan as appropriate

Architecture will have to be revised taking into account the re-alignment of the NAFISAT States, refer to paragraph 2 b) above

3) Timelines for Technical Group

a) The timelines based on the target dates as proposed are shown in the Gantt chart below:

ID	Task Name	Duration	Start	Finish
1	**Time Frame for Technical Team**	**1437 days?**	**Fri 13-06-28**	**Mon 18-12-31**
2	Revisit cost estimates & Provide input to Financial & Admin. Groups	46 days	Mon 13-07-01	Mon 13-09-02
3	Revise AFI ATN Routing Atchitecture	110 days	Mon 13-07-01	Sat 13-11-30
4	Complete work i.r.o. maintenance options	110 days	Mon 13-07-01	Sat 13-11-30
5	Review and update the status of implementation of the best practices as adopte	110 days	Mon 13-07-01	Sat 13-11-30
6	Conduct a gap analysis against agreed best practices for networks	110 days	Mon 13-07-01	Sat 13-11-30
7	**Develop a convergence plan with priorities and timelines to close ider**	**1437 days?**	**Fri 13-06-28**	**Mon 18-12-31**
8	2012 to 2014 – National deployment	393 days?	Mon 13-07-01	Wed 14-12-31
9	2013 – 2015 - Regional deployment	655 days?	Fri 13-06-28	Thu 15-12-31
10	2014 – 2018 – Inter-regional deployment	1304 days?	Wed 14-01-01	Mon 18-12-31
11	Analyze possible impact of the alignment of ANPs and SUPPs on its work	284 days	Mon 13-07-01	Thu 14-07-31



Appendix 3.4C

INTEGRATED REGIONAL TELECOMMUNICATION INFRASTRUCTURE PROJECT
LEGAL AND ADMINISTRATIVE ASPECTS

a)Oversight Model

Type of Agreement – *International treaty or administrative agreement*

- Administrative agreements as are currently in place

Institutional framework – *Organization to set up, fund, maintain and operate Network*

- Keep the current structures that manage the various networks. Include an overall co-ordination body made up of representatives from the various network management groups, two members each that will rotate, one member from the secretariat (ICAO or AFCAC to be determined).

Funding Mechanism – *The costs involved are shared among the participating States in a fair and equitable manner*

- As currently decided by each body.
- Each body will financially support the costs related to the coordination body equally.

Oversight body – *Defines nature of organization to implement and manage facility*

- Strategic oversight will lie with the coordination body
  Alignment of technology, rollout, requirements, services etc.
- Safety and technical oversight (audit function) will coordinated with ICAO.
- Operational administrative, technical and safety oversight will continue as currently run within each network setup.

Mandate of Oversight body – *Ensure set up, operation, maintenance, expansion and funding*

- Ensure set up, operation, maintenance, expansion and funding as per the current network body structures of AFISNET, CAFSAT, NAFISAT and SADC VSAT
- The safety and technical audit function is to be carried out against applicable SARPS, regional plans and APIRG requirements in coordination with ICAO.

Mandate of Network provider – *Functions and supporting services*

- As currently mandated by the governing bodies of the AFISNET, CAFSAT, NAFISAT and SADC VSAT.
- Implement, operate, maintain the network and ensure present and future performance in line with strategic objectives and oversight body requirements

Any delegated ANSP aspects – *Information on expected consequences on the overall AFI air navigation system or any part thereof*

- Provision of aeronautical ground to ground interconnection services on behalf of States

Handling of Pre-implementation costs – *Determination of the costs attributed should be in a manner acceptable to all the participating States*

- States are responsible for costs within the current structures of AFISNET, CAFSAT, NAFISAT and SADC VSAT.

Cost Determination – *Format of annual costs, i.e. Capex, operational, maintenance, administrative overheads, depreciation and/or amortization and per-implementation*

- All expenses

Cost sharing – *Each state to assume responsibility for its share of the costs involved (partnership with users)*

- States are responsible for costs within the current structures of AFISNET, CAFSAT, NAFISAT and SADC VSAT.

Cost Recovery mechanism – *To be "multinationally" financed or refinanced by a State, group of States or by an agency as established under the authority of an agreement by States*

- Cost recovery is managed within the current structures of AFISNET, CAFSAT, NAFISAT and SADC VSAT.

Budget Approval – *Proper financial control will require costs and revenues to be estimated in advance*

- Budget approval is handled within the current structures of AFISNET, CAFSAT, NAFISAT and SADC VSAT.

Financial audit and taxation – *Addressed in the context of the overall operations*

- Managed within the current structures of AFISNET, CAFSAT, NAFISAT and SADC VSAT.
- It is however recommended that all bodies are audited by an external audit body annually and taxation is handled as per the requirements of the state.

Any other issues –

- None

b) States' Commitment

Financial, Managerial and other contracting aspects –

- There are currently agreements in place within the AFISNET, CAFSAT, NAFISAT and SADC VSAT structures that should continue, however the agreements that are in place should ensure that the following elements are defined:
    - Objective
    - Obligations of the parties
    - Definition and description of the network and services
    - Establishment, operation and maintenance of the network
    - Legal, financial and other responsibilities and liabilities
- Proposed Coordinating body requires:
    - Terms of reference / mandate
        - Objective
        - Defined membership
        - Tenure
        - Obligations of the parties
        - Legal, financial and other responsibilities and liabilities

C, D and E) Legal, Governance and Financial Issues

Managerial and other contracting aspects should be included as listed:

- Governing bodies and decision making arrangements
- Organisation and staffing
- Consultation
- Pre-implementation considerations
- Cost Determination
- Cost sharing
- Recovery of costs from users
- Budgeting
- Authority to approve the budget
- Financial auditing

- Taxation and other government levies
- Procedures for settlement of disputes
- Accessions, withdrawals, amendments to and termination of agreement
- Any other relevant business

Maintenance

The aspect of maintenance across all networks should be managed as part of the individual contracts with the applicable service providers in terms of the agreements in place in the AFISNET, CAFSAT, NAFISAT and SADC VSAT agreements as amended when necessary. This should include but not be limited to:

- Service level agreement
- Support plan

Participating members of the administrative group

- Botswana, Cameroon, Egypt, Ethiopia, Kenya (chairman), Libya, Mozambique, Nigeria, Seychelles, South Africa, Sudan and Zambia

-END-

Appendix 3.4D

TASK FORCE ON THE INTEGRATED REGIONAL TELECOMMUNICATION INFRASTRUCTURE PROJECT

PROPOSED REVISED TERMS OF REFERENCE

1. Vision

a) Improve the contribution of the aeronautical telecommunication infrastructure in addressing safety endeavours in the AFI Region.

b) Enhance Air Navigation Safety, Capacity and Efficiency through elimination of deficiencies associated with AFI aeronautical infrastructure.

2. Objectives

a) Develop a sustainable and integrated/interoperable regional IP-based Data Communication Network primarily based on VSAT Technology to provide effective aeronautical telecommunications services in AFI region;

b) Upgrade technical capabilities of existing VSAT networks to comply with the ICAO SARPs and guidance material, user requirements and global best practices;

c) Ensure financial sustainability of the networks through equitable and fair allocation of costs to States and users;

d) Create harmonious and seamless administrative oversight framework for the networks;

e) Ensure States' commitment to this initiative;

f) Develop the AFI ATN Strategy and Implementation Plan; and

g) Apply appropriate cost-effective technologies aligned with the Global Air Navigation Plan (Doc 9750) Aviation System Block Upgrades (ASBU) Methodology and associated technology roadmaps for communications, navigation and surveillance (CNS), information management (IM) and avionics.

3. Deliverables

The deliverables expected from the Task Force include:

3.1. Technical:

P**urpose of the multinational air navigation facility/service and its operational and technical justifications.** This should include the overall plan and targets for the development and the establishment of the facility/service. The likely implications if any, on regulations, working routines, equipment, premises and maintenance should be included. Information on the expected consequences on the overall AFI air navigation system or any part thereof should also be included. ***Deliverables*** *a) Detailed gap analysis based on ICAO SARPs and guidance material, user requirements and global best practices;* *b) Architectural requirements;* *c) Recommendations for a road-map, to be implemented by States; and* **d)** *Maintenance.*
Need for an amendment to the AFI Regional Air Navigation Plan. Assess the need if the establishment of a multinational facility/service will necessitate an amendment to

the AFI Regional Air Navigation Plan, to be carried out in accordance with established procedures.

Deliverable
Amendment proposals to the Air Navigation Plan as appropriate.

Composition of the Technical Team:

- Egypt, Botswana, Mozambique, Nigeria, Rwanda, France/Reunion, South Africa (**Team Leader**), Swaziland, Tanzania, Uganda, ASECNA, Roberts FIR, IATA,

3.2. Financial

F**inancial implications and cost-effectiveness.**
Related information should include estimates of the total costs of the multinational facility/service covering, as required, research and development, implementation, operation and maintenance, administration, and capital costs. how all costs incurred prior to the operational phase will be financed; assessing savings which may accrue from the implementation of the facility/service and comparing these savings to the total cost estimates; proposals as to how cost shares of States participating in the provision of the project are to be determined. Also, assessment needs to be provided on impact on users from charges for the facility/service concerned.

Financial aspects
The participation of States in the provision of a multinational facility/service is based on the assumption that any State having supported and agreed to the implementation of such a facility/service and making use of it should also shoulder its respective share of the costs involved.

Deliverables

a) Cost estimates;
b) Funding (project teams and integrated network model);
c) Cost recovery methods (cost sharing amongst States, billing); and
d) *Maintenance.*

Composition of the Financial Team:

- South Africa, France, Kenya, Uganda, ASECNA (**Team Leader**), IATA

3.3 **Administrative/Legal:**

Managerial implications and other contractual aspects
The participating States would need to formalize in an agreement the terms under which the multinational facility/service is to be provided. A primary aim of the agreement should be to ensure that the costs involved are shared among the participating States in a fair and equitable manner.

Deliverables

a) Oversight model;
b) States' commitment;
c) Legal issues; Governance;
d) *Maintenance; and*
e) Draft agreement(s)

Composition of the Administrative/Legal Team:

- Egypt, Namibia, Kenya (**Team Leader**), South Africa Tanzania, ASECNA, IATA,

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