



8th NAFISAT SUPERVISORY COMMITTEE MEETING
(Mahe, Seychelles, 25 – 26 March 2013)

Agenda Item 7: Review of APIRG/18 Conclusions of relevance to NAFISAT

7.3d VSAT Network Best Practices and AFI ATN Architecture

(Presented by ATNS)

SUMMARY

This working paper presents information on the conclusions of APIRG/18 and the relevance thereof on the NAFISAT network

References:

- APIRG/18 Conclusions
- 8th NAFISAT Supervisory Committee Meeting

1 BACKGROUND

1.1 At the previous NAFISAT Supervisory Committee meeting in Cape Town, feedback was given in respect of the work completed by the Technical Group of the ICAO AFI VSAT Managers meetings. The inaugural meeting of the AFI VSAT Managers was hosted by ATNS in Durban and a further Workshop was arranged in Dakar. A second meeting took place in Cameroon in February 2012 to finalize the work for APIRG/18.

1.2 The objectives of the AFI VSAT Managers meeting are briefly:

- To develop a sustainable integrated/interoperable VSAT networks for aviation communications services in AFI region
- Upgrade technical capabilities of the network to comply with the global best practice
- Ensure financial sustainability of the networks
- Create harmonious and seamless administrative oversights
- Achieve the ATN concept for AFI

- Apply appropriate costs effective technologies
- 1.3 The technical Group developed a list of Best Practices for VSAT networks based on ICAO requirements, (SARPs) and guidance material, user requirements and general aviation best practices and completed a GAP Analysis of the existing four regional networks.
- 1.4 A basic Network design was completed and cost estimates were compiled to allow the Financial and Administrative Groups to continue with their work.

2 DISCUSSION

2.1 From a point of view of the NAFISAT network the following two conclusions by APIRG/18 are important.

2.1.1 The APIRG/18 endorsed the finalized AFI ATN Architecture Plan as amended by the AFI VSAT Managers Technical Group and the following conclusion was formulated:

APIRG CONCLUSION 18/20: AFI ATN ARCHITECTURE PLAN

That AFI States implement the AFI ATN Architecture Plan shown at Appendix 3.4C to this (APIRG/18) report.

Refer to the attached Annexure A for the AFI ATN overlay architecture plan as approved by APIRG/18. As the selected NAFISAT VSAT terminals from part of the existing networks, the advantage for NAFISAT is that the ATN Architecture plan can be developed in a cost effective way by utilizing the existing terminal infrastructures.

2.1.2 The Group approved the Best Practices and requested VSAT Network Managers using legacy practices to develop transition plans towards the implementation of these agreed best practices. The following Conclusion was formulated:

CONCLUSION 18/25: ADOPTION OF BEST PRACTICES FOR AFI VSAT NETWORKS

That the AFI States and Air Navigation Services Providers (ANSPs) operating aeronautical VSAT Networks adopt the best practices stated at Appendix 3.4G to this (APIRG/18) report, as well as any other best practices to be developed or adopted by APIRG.

Refer to the attached Annexure B for an extract of important Best Practices of VSAT Networks Systems architecture, operations and interconnecting. It is important to note that NAFISAT already complies with the MF-TDMA satellite access method (Item 8).

Item 17 - Connectivity (internal connectivity and interconnections with other networks) –NAFISAT and SADC VSAT II are of course fully interconnected and interoperable.

Another important point is Item 19 that recommends that ATN be based on the IPS and that the X.25 protocol must be discontinued. When NAFISAT was developed X.25 was recommended by ICAO. Because of the new IP requirement the spectrum that was allocated to X.25 will now be used for IP based ATN applications in NAFISAT.

3 SUGGESTED ACTION TO BE TAKEN BY THE MEETING

It is suggested that the following actions be taken by the Meeting:

- 3.1 Take note of the work completed by the Technical Group of the AFI VSAT Managers meeting and recommendations and approvals by APIRG/18 in respect of this.
- 3.2 Ensure that the above APIRG conclusions be taken into account and applied in respect of the NAFISAT network.
- 3.3 Item 17 in the table should be updated as indicated above.

APIRG/18 - APPENDIX 3.4G

VSAT NETWORKS BEST PRACTICES (Extracts of important paragraphs)

	Best practices	Guidance material	Network compliance status			
			AFISNET	CAFSAT	NAFISAT	SADC
8. Satellite access method	Multiple Frequency – Time Division Multiple Access (MF-TDMA)	ICAO, Annex 10, Aeronautical Telecommunications, Volume III ICAO, Doc 9776, Manual on VHF Digital Link Mode 2 ICAO, Doc 9805, Manual on VHF Digital Link Mode 3	Yes ¹⁾	No	Yes	Yes
9. Lease Bandwidth	Available bandwidth should accommodate current and future services	ICAO, Annex 10, Aeronautical Telecommunications, Volume II ICAO, Annex 11, Air Traffic Services ICAO, Doc 4444 – PANS/ATM ICAO, Doc 9880- Detailed Technical Specifications on ATN ICAO, Doc 7474 (ANP/FASID)	Yes	Yes	Yes	Yes
12. Network control centre (NCC)	Network control centre (NCC) should be implemented for all networks. Dedicated Engineering Service Channels recommended	ICAO, ALLPIRG/5, Conclusion 5/16	No	No	Yes	Yes
14. Services supported	Aeronautical fixed services (AFTN, ATS/DS) Aeronautical mobile service (AMS) – Extended VHF radio coverage Aeronautical Telecommunication Network (ATN) applications (AMHS, AIDC)	ICAO, Annex 10, Aeronautical Telecommunications, Volume II ICAO, Annex 11, Air Traffic Services ICAO, Doc 4444 – PANS/ATM ICAO, Doc 9880- Detailed Technical Specifications on ATN ICAO, Doc 7474 (ANP/FASID)	Yes	Yes	Yes	Yes

17. Connectivity (internal connectivity and interconnections with other networks)	Full connectivity required within and between all the networks ICAO to address all the identified non-technical issues	ICAO, Doc 7474 – Air Navigation Plan (FASID) Connectivity Matrices for ATS/DS and AFTN AFI AFTN Routing Directory	No ²⁾	No ²⁾	No ²⁾	No ²⁾
19. Base band transmission protocols	Use of standardised bit-oriented protocols Internet Protocol Suite (IPS) recommended X25 to be discontinued³⁾	ICAO, Annex 10, Aeronautical Telecommunications, Volume III ICAO, Doc 9896 – Manual on ATN using IPS Standards and Protocols AFI/7 -Recommendation 9/6 APIRG Conclusion 13/10 APIRG Conclusion 16/13 APIRG			Yes ⁴⁾	Yes ⁴⁾

Notes

- 1) AFISNET only complies part as their operational network is based on FDMA
- 2) Most interconnections are implemented, NAFISAT and SADC fully interconnected
- 3) ATN support in SADC and NAFISAT is presently based on X25 protocol
- 4) Added status i.t.o. NAFISAT & SADC– original document does not indicate the status; NAFISAT & SADC internet capability must be expanded to accommodate ATN applications (AMHS, AIDC etc.)