INTERNATIONAL CIVIL AVIATION ORGANIZATION
Western and Central African (WACAF) Office

First Review Meeting of AFI VSAT Network Managers
(AFI VSAT Review/1)
(Dakar, Senegal, 3 to 5 October 2011)

Agenda Item 3a:

Review of GAP Questionnaire

(Presented by ATNS)

SUMMARY

The working paper provides details of the final GAP Questionnaire submitted to the members of the Technical Team

REFERENCE(S)

- Technical Team Communication Plan
-

1 Introduction

The goal of this project is to draft a report for a VSAT presentation to the APRIG/18 meeting tentatively scheduled for the first quarter 0f 2012, Kampala (Uganda). In order to have the report ready the work will have to be completed by the end of January 2012. The report must cover at least the following information:

1.1 VSAT Technical GAP analysis document

1.2 Response from VSAT network managers

1.3 Planned actions to address identified technical VSAT Gaps

1.4 Estimated budgetary cost to address identified technical VSAT Gaps

1.5 Recommendations

2 Discussion

2.1 Development of a draft Questionnaire document was completed and submitted to the Group Members on 24 August 2011, to provide them with the opportunity to add any additional question, changes required, etc.

2.2 The feedback received was incorporated in the GAP Questionnaire and the final version was submitted to the Technical Group members to allow them to study and populate the Questionnaire and returning the completed document for evaluation.

2.3 The subsequent phases will include the evaluation and compilation of the information and inputs received and completion of a draft report before the APIRG/18 preparatory meeting in Dakar.

2.4 It should be noted that the compilation of information, analysis and drafting of the report will be a time consuming process and it will assist the team if more time could be allowed in the program schedule for this – the revision of the program schedule is covered in another working paper.

3 Conclusion

The meeting is invited to:

3.1 Note the information provided in this working paper.

3.2 Take the information into account during discussions.

---END---

	Best practices	Guidance material	Questions	Response by Network Service Provider				
				Compliant		Elaborate in more detail on compliance option selected	Indicate planned actions to address Gap	Expected Budgetary cost to address Gap
				Yes	No	(Attach separate documentation if necessary)	(Attach separate documentation if necessary)	
1.Year of completion	Not applicable							
2.Period of Inception	Not applicable							
3.Membership	Not applicable							
4.Satellite used	Contingency planning required to ensure continuity of service in case of disruption or failure of operated satellite States shall provide the degree of facility reliability and availability consistent with their operational requirement.	ICAO, Annex 11 — Air Traffic Services, Section 2.30 ICAO, Annex 10, Volume I, Section 2.5 and Attachment F ICAO, Doc 9859 - Safety Management Manual.	**Satellite contingency Planning**					
			4.1 Indicate which satellite is used					
			4.2 Indicate the life expectancy of the satellite					
			4.3 Describe what alternative arrangements exist, should there be a catastrophic failure of the satellite in use					
			4.4 Indicate whether reserved spectrum is available on **another** satellite					
			4.5 Should operation be moved from the existing satellite to another satellite, what will be the procedure to re-establish services?					
			Facility Reliability, Availability & Security					
			4.6 Indicate whether all the VSAT network terminals are located in a secure area under the jurisdiction of the ANSPs					
			4.7 Confirm that no unauthorized persons have access to the VSAT network terminals					
			4.8 Is an Un-interruptible Power Supply available for the VSAT terminal					
			4.9 If so, what is the back-up time					
			4.10 Describe what happens after the back-up time has elapsed.					
			4.11 Is there no-break power available on the airport and is the VSAT connected to that supply?					
			4.12 Indicate whether the ATS/DS services, AFTN services, etc. are dependent on terrestrial data cables or other services located outside the security area of the ANSP's, in other words where the ANSP does not have any control over its availability, management , etc.					
			4.13 If so, indicate the approximate length of the terrestrial data cable that is outside the security area of the ANSP's					
			4.14 Indicate any other data cables or supporting services related to the VSAT service that is located outside the security area of the ANSP's					

5.Transponder (Up/Down)	Contingency planning required to ensure continuity of service in case of disruption or failure of operated satellite States shall provide the degree of facility reliability and availability consistent with their operational requirement.	ICAO, Annex 11 — Air Traffic Services ICAO, Annex 10, Volume I, Section 2.5 and Attachment F ICAO, Doc 9859 - Safety Management Manual.	5.1 Indicate which satellite transponder(s) are used					
			5.2 Indicate what contingency arrangements are in place by the satellite service provider in case to ensure continuity of services					
			5.3 Is the spectrum in use based on non-preemptible service					
			5.4 Indicate when the present lease agreement will expire					
			5.5 Is a first right of refusal available when the lease expires					
			5.6 If not, describe what arrangements are in place to ensure continuation of the VSAT services					
6.Frequency band	In accordance with ITU Radio Regulations	ITU, Radio Regulations	6.1 Indicate the frequency bands utilized by the satellite services and the Beam Type (e.g. East Hemi beam, Global beam, etc)					
			6.2 Confirm that the VSAT services comply with the ITU requirements for the frequency bands utilized					
7.Topology	Meshed network		7.1 Is the network topology meshed					
			7.2 Is the network topology a combination of star & meshed					
			7.3 Is the star topology upgradable to a meshed topology					
			7.4 If so, describe briefly what the upgrade will involve					
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	8.1 Is the network satellite access method based on MF-TDMA					
			8.2 If the network satellite access method is based on MF-TDMA, is there a backup synchronization station in place					
			8.3 If the network satellite access method is **not** MF-TDMA, indicate the access method used for the network					
			8.4 Indicate the main reasons for selecting the access method used					
			8.5 How is bandwidth allocated for all services provided (i.e. permanent, on demand)					
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)	9.1 Is sufficient spectrum available for new terminals, future services and applications.					
			9.2 If not, how will this issue be addressed					
			9.3 Is the available capacity contended? If so, what is the contention ratio?					

10.Administrative arrangements	States commitment should be formalized and documented, including delegation of operational, technical and financial authority (as applicable).	ICAO, Doc 7474 (ANP/FASID) – Guidelines for multinational facility/service	10.1 Are there any formal arrangements between States and network service provider in place in respect of technical, operational and financial responsibilities.					
			10.2 Briefly describe the format and structure of formal arrangements					
			10.3 What is the term (duration) of these formal arrangements					
11.Technical arrangements (Maintenance Management)	Network control center (NCC) should be implemented for all networks.	ICAO, ALLPI RG/5, Conclusion 5/16	11.1 Is an NCC implemented for maintenance and management of the network					
			11.2 Briefly describe the network maintenance philosophy and how corrective & preventative maintenance are conducted					
			11.3 Indicate the Network management protocol, and type communication circuits used (e.g. SNMP, ethernet IP)					
			a) Is there a pro-active management facility?					
			11.4 Briefly describe the management of spares used for corrective maintenance					
			11.5 Briefly describe the fault reporting procedure between the remote VSAT terminals and the NCC					
			a) Is there a dedicated helpdesk/service desk for fault reporting					
			b) If so, how is it accessed (phone call - international/local or other communication medium - mail/fax, etc)					
			c) What is the percentage of fault resolution on first call?					
			d) What is the escalation procedure and how is this activated					
			e) How is fault resolution reporting done? Are there SLAs on fault resolution with regard to Mean-Time-To-Respond and Restore					
			11.6 Provide a list of all VSAT network terminals and					
			a) the antenna size for each terminal					
			b) the ampliifier output power fo reach terminal					
			c) the minimum excess amplifier power available to add another RF carrier					
			11.7 Provide a list of all interconnections between all the VSAT network terminal listed (AFTN & ATS/DS)					
			11.8 Provide a list of all connections between all the VSAT network terminal listed and adjacent networks					
			11.9 What is the current VSAT circuit availability (Recommended availability >= 99.8%)					
			11.10 Indicate the BER applicable to the physical layer of communications (with Forward Error Correction employed) (recommended BER <= 1 in 10-7).					
			11.11 Indicate the total one-way voice circuit latency (including voice compression and encoding) (recommended value < 400 ms)					
			11.12 Indicate the network call blocking probability (recommended value <= 2.5 x 10-3 (or 1 in 400 attempts					
			11.13 Indicate the set-up time for a voice call (Recommended set-up time <= 2 s)					
			11.14 Indicate the voice compression ratio and type of compression (G.729, G.726,G.711, etc)					
			11.15 Will any components reach it's end-of-life during the operation of the network					
			11.16 If so how will these end-of-life components be managed					
			11.17 Is training provided to the local on-site technicians					
			11.18 Is refresher training provided for technician					
			11.19 If so, how often does refresher training take place					
			11.20 At what level of training is maintained (I,O,D Level)					

12.Dedicated engineering service channel	A dedicated service channel is recommended to facilitate coordination of maintenance between networks' stations	ICAO Annex 10, Volume I, Attachment F	12.1 Is a dedicated engineering maintenance channel available for voice communication between the NCC and the on-site technicians					
			12.2 If not, is a dedicated engineering maintenance voice channel planned					
13.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)	13.1 Confirm that all primary services mentioned are supported					
			13.2 Indicate which primary services can **not** be supported					
			13.3 If not all primary services are supported, can the network be adapted to support these services					
14. New Services to be supported	To be defined.		14.1 Indicate what new aeronautical services, e.g. as required by ANSPs, are planned that will utilize the VSAT network					
			14.2 Can the network support these services					
			14.3 What additional new services can be supported by the VSAT network (e.g. radar data, Met services, ADS-B/C, CPDLC, GNSS, AIM, etc.)					
15. Funding mechanism for the networks	Sustainable funding mechanism required for all networks.	ICAO, Doc 9082— Policies on user charges	15.1 Briefly describe how the operation of the network is presently funded					
			15.2 Briefly describe how new services will be funded to ensure sustainability of the network					

16. 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 Director	16.1 Are all interconnections required with adjacent networks in terms of the AFI Plan addressed in such a way that it provides seamless operation					
			16.2 How are these seamless operations achieved					
			16.3 Indicate all the interconnections that are not seamless					
			16.4 Briefly describe the reason for these interconnection not being seamless					
			16.5 Are there any adjacent networks that need to be interconnected that are currently not connected					
			16.6 If so, name these networks					
			16.7 Will it be possible to provide seamless operation for any planned interconnections with adjacent networks					
			16.8 Briefly describe how this will be achieved					
			16.9 If seamless operation can not be achieved, briefly describe the reasons for this					

17. Management of interconnections	Formal agreements recommended to address interconnection issues		17.1 Are there agreements currently in place between adjacent network service providers in respect of operation, fault reporting, maintenance, etc.					
			17.2 If so, briefly describe how interconnections between adjacent networks are managed in respect of operation, fault reporting, maintenance, etc.					
			17.3 If not, indicate how this deficiency will be addressed					
			17.4 Is your current network capable of supporting a Multinational facility/service as envisaged in Conclusion 1/11 of the 1ST AFT VSAT Managers Meeting? If so, please describe how?					
18. Base band transmission protocols	Use of standardized bit-oriented protocols Internet Protocol Suite (IPS) recommended X25 to be discontinued	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 Conclusion 16/14	18.1 Can the network support IP operation as recommended by ICAO					
			18.2 Is it planned that the network will still accommodate legacy protocols in future					
19. Transmission speed	AFTN main circuits: 1200 bauds ATN circuits 9.6 Kbps ATN backbone circuits: 64 Kbps	APIRG Conclusion 12/13 APIRG ATN/TF/2 Report	19.1 Does the current network comply with the recommended transmission speeds for AFTN and ATN					
			19.2 If it does not comply, indicate what the current transmission speeds are and identify the specific services and circuits that it is applicable to.					
20. AFTN circuit	Circuit availability should be monitored and provided to ICAO Regional Office on monthly basis. Minimum requirement is: 99.8% (excluding the end-user equipment attached to the VSAT circuit)	ICAO, Doc 7474, ANP (AFT/7 Recommendations 9/3 and 9/4)	20.1 Is AFTN circuit availability monitored					
			20.2 If not, what is the reason for the non-compliance					
			20.3 Does the AFTN circuit availability comply with the recommended minimum value of 99.8%					
			20.4 Is the information made available to the ANSPs for submission to the ICAO Regional Office					

21.Message transit times	Message transit times should be monitored and provided quarterly to ensure that operational requirements are met: high priority message (5 minutes) and a low priority message (10 minutes)	ICAO, Annex 11, Air Traffic Services, Chapter 6, Paragraph *XXX* ICAO, Doc 8259, Manual on the Planning and Engineering of AFTN APIRG Conclusion 12/13	21.1 Is the message transit times monitored in the network					
			21.2 If so, is it provided to ICAO on a quarterly basis					
			21.3 If not, are there any provisions in place to provide this information in future					
22.AFTN circuit loading	Performance evaluation of AFTN circuits is required on the basis of statistics collected for a period of minimum three days at the interval of six months from 23 to 25 April and October. These include traffic volume, traffic statistics and circuit occupancy, which are needed to assess the suitability of the modulation rate of AFTN circuits.	ICAO, Doc 8259, Manual on the Planning and Engineering of AFTN	22.1 Is the AFTN circuit loading measured as required by ICAO					
			22.2 If not, is there any provision in place to perform measurements in future					