



Meeting of AFI VSAT Networks Managers

Dakar, Senegal, 3 – 5 October 2011

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**Agenda Item 3: Progress made by financial team**

**(Presented by the financial Team)**

ASECNA (**Team Leader**), ATNS (South Africa), IATA, La Reunion (France), Kenya, Uganda

**SUMMARY**

Ref. : Report of first AFI VSAT managers meeting (Kwa-Zulu Natal, 13-15 June, 2011);

This working paper presents the progress made by the financial team regarding the development of an AFI integrated Aeronautical Telecommunication Infrastructure and calls for inputs from the technical and the administrative teams to finalize the task.

**1. Introduction**

The First Meeting of the AFI Aeronautical VSAT Networks Managers (AFI VSAT/1) was held in the in Kwa-Zulu Natal, South Africa, from 13 to 15 June 2011. The meeting per Conclusion 1/10 established a Task Force to address issues related to the development of a regional project aimed to enhance the overall performance of AFI aeronautical VSAT networks, and converge towards a consolidated regional ATN infrastructure.

**2. Discussion**

Planning and implementing a VSAT network involves a decision making process. In some cases the process requires more than one iteration to reach to the most economical solution. The activities in the planning process include:

- defining the service requirements;
- defining expected network objectives in terms of performance, quality, and availability;
- defining the network size and design;
- comparing the design against available equipment, and analyzing the manufacturer's alternatives to fulfill the requirements and design;
- evaluating the costs;
- preparing an implementation plan;
- determining the space segment capacity required and reserving the capacity with INTELSAT;
- defining specification for procurements; and
- Listing all post implementation operational requirements

This working paper presents in appendix 1, the results of the financial team, made of ASECNA (Team Leader), ATNS (South Africa), IATA, La Reunion (France), Kenya, Uganda according to the terms of reference in Appendix 1 to the report with the expected deliveries:

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

### **3. Actions by the meeting**

The meeting is invited to:

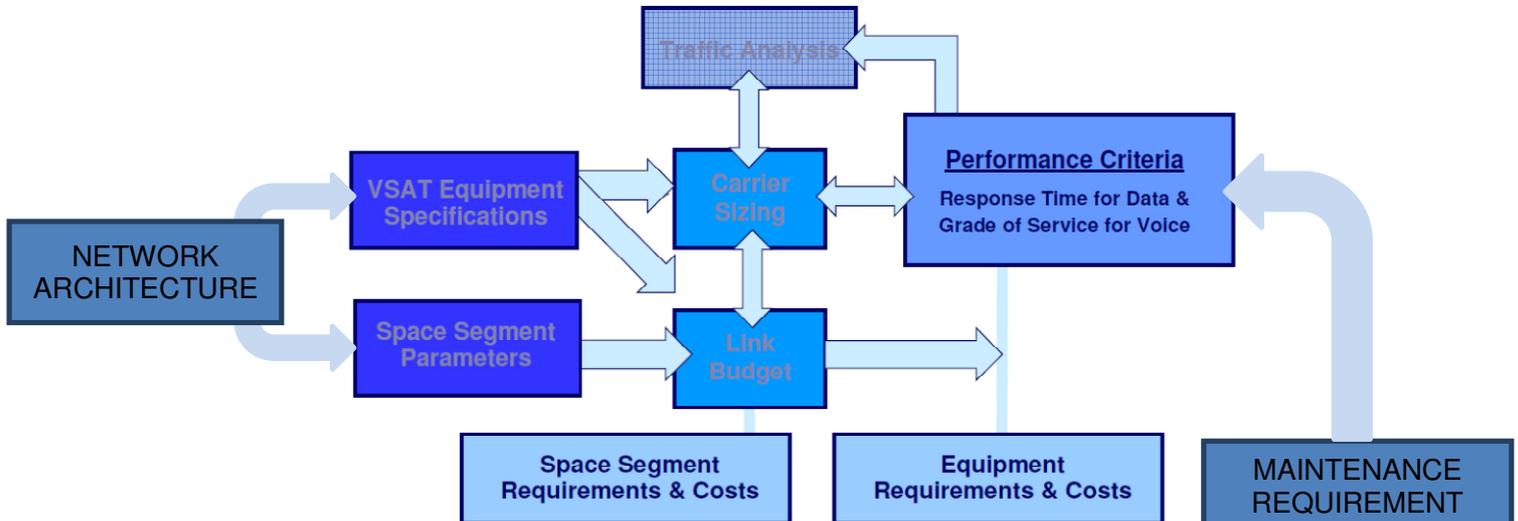
- Take note take note of the information provided above;
- To comment and amend the document

**DISCUSSION DOCUMENT  
FOR  
AFI VSAT MANAGERS MEETING  
DAKAR, SENEGAL  
03 October 2011**

**Financial Team:** ASECNA (Team Leader), ATNS (South Africa), IATA, La Reunion (France), Kenya, Uganda

**1. Cost estimates**

The cost evaluation of the VSAT Network is an important step in the planning process and will be based on technical and administrative considerations such as the VSAT network topology, the backup and redundancy schemes the network operation organization. The following diagram points out the main components and their interrelations.



The cost estimates may include an investment and software cost, operation cost, implementation cost and additional cost.

## **2.1 The Network implementation cost**

The network implementation costs include:

### **2.1.1 Hardware and software costs**

The hardware cost will derive from the technical solution adopted at the technical level which must take in consideration the following hypothesis:

- Renew of the VSAT networks
- Upgrade and migration of the existing Networks to converge to the network architecture proposed
- Network backup (satellite network, teleport, ground network...)

The implementation of a new global network is to be technically and operationally justified. If it is assumed that the second and third case is to be taken consideration the additional cost can be evaluated consequently. In any case, with regard to the proposed topology and architecture from the technical team, a cost evaluation could be provided based on the experience of the VSAT managers and the cost available from the suppliers. However the description of the various items from the technical team will be required. The table in appendix could be used to evaluate the costs

### **2.1.2 Staff and training(input from technical and administrative teams)**

Additional staff may be required to operate and maintain the VSAT network. Staff training on the new VSAT equipment will also be required. The staff must be evaluated in order to maintain the minimal Service Level Agreement defined by the Administrative Team the earth stations. Aeronautical schools from AFI VSAT managers could contribute to the training to get the appropriate staff at the various nodes (additional didactic equipment will be provided in the frame work of the project)

### **2.1.3 Spare parts(input from technical and administrative teams) \_:**

The cost of the spare parts will be evaluated in connection with the technical and the administrative teams inputs. However in general, at the hub, it is typical to have 1 spare for each 10 items of online equipment (such as voice and data card units). For the remote VSAT terminals, it is typical to have 1 spare for every 20 items of the common equipment (such as SSPA and ODUs). Full redundancy is to be taken in account. The cost range for spare equipment would be 5 to 10 percent.

### **2.1.4 Local facilities(input from technical and administrative teams) \_:**

Sites may require a site survey, local permit approval, and possibly frequency coordination, followed possibly by civil works, power, and air conditioning. Local conditions may indicate the need for additional heating, cooling, or dehumidifying equipment. Ancillary equipment such as power installations, and heating or air conditioners for the equipment can add to the cost.

## **2.2 Operational cost**

The operational costs can be divided into satellite resources, staff, and facilities. Facilities operational costs consist of power, heat, and air conditioning costs.

### **2.2.1 Space segment lease cost (input from technical and administrative teams)**

The space segment constitutes an essential cost in the operation of the network and according to INTELSAT flexible tariff system, the client can choose to either pay per carrier or to lease a portion of a transponder (INTELNET lease). INTELNET leases provide the client with the highest flexibility possible.

The client is free to define the service quality, availability, and any parameter affecting the network performance.

The network architecture will permit to the technical team to design the appropriate bandwidth to operate the network. With regard to the dimension of the network, a special negotiation could be undertaken with INTELSAT to benefit from the best lease prices.

### **2.2.2 Staff cost***(input from technical and administrative teams)*

Operational and maintenance staff will be needed to operate the VSAT network. A minimum staffing level at the hub and the remote station including engineers, technicians, and support staffs is to be determined in connection with the technical and the Administrative teams. In addition, it can be assumed that one routine maintenance visit will be required each year for each VSAT site.

### **2.2.3 Facilities' costs***(input from technical and administrative teams)*

Facilities have ongoing expenses for such items as power, heat, and air conditioning. These costs are highly dependent on existing infrastructure and policies in the service area.

### **2.2.4 Maintenance costs** *(input from technical and administrative teams)*

- Spare parts repair cost (turn around and delay).
- Renew costs for further investment and the inevitable replacement of some equipment becoming out-dated

## **2.3 Other Costs**

- Preparation of the technical specification (15 days of a technical team)
- Evaluation of the offers (15 days of a technical team)
- Transport, installation and service
- Complementary Equipment (in connection with the status of some equipment)

## **3 Funding (project teams and integrated network model)**

**3.1 Sponsors** (ICAO, Regional Institute (ECOWAS, SADC....), AU, EU, ACP,...)

**3.2 ANSP, VSAT Networks Providers,**

**3.3 Sustainable provision/maintenance of spare parts (is the maintenance of the infrastructure *adequately funded*)?**

**3.4 Funding** arrangements for the networks

## **4 Cost recovery methods (cost sharing amongst states, billing)**

- *Global (ASECNA)*
- *Special fees(NAFISAT, SADC) through IATA*
- *Fund to be saved for to renew the network*

## **5 Maintenance (organization)**

### **5.1 Organization of maintenance (Data base, Ticket, LOP)**

- centralized, (advantages, inconvenient, costs)
- Shared(advantages, inconvenient, Costs,)
- Policy regarding Spare parts
- Centre of reparation

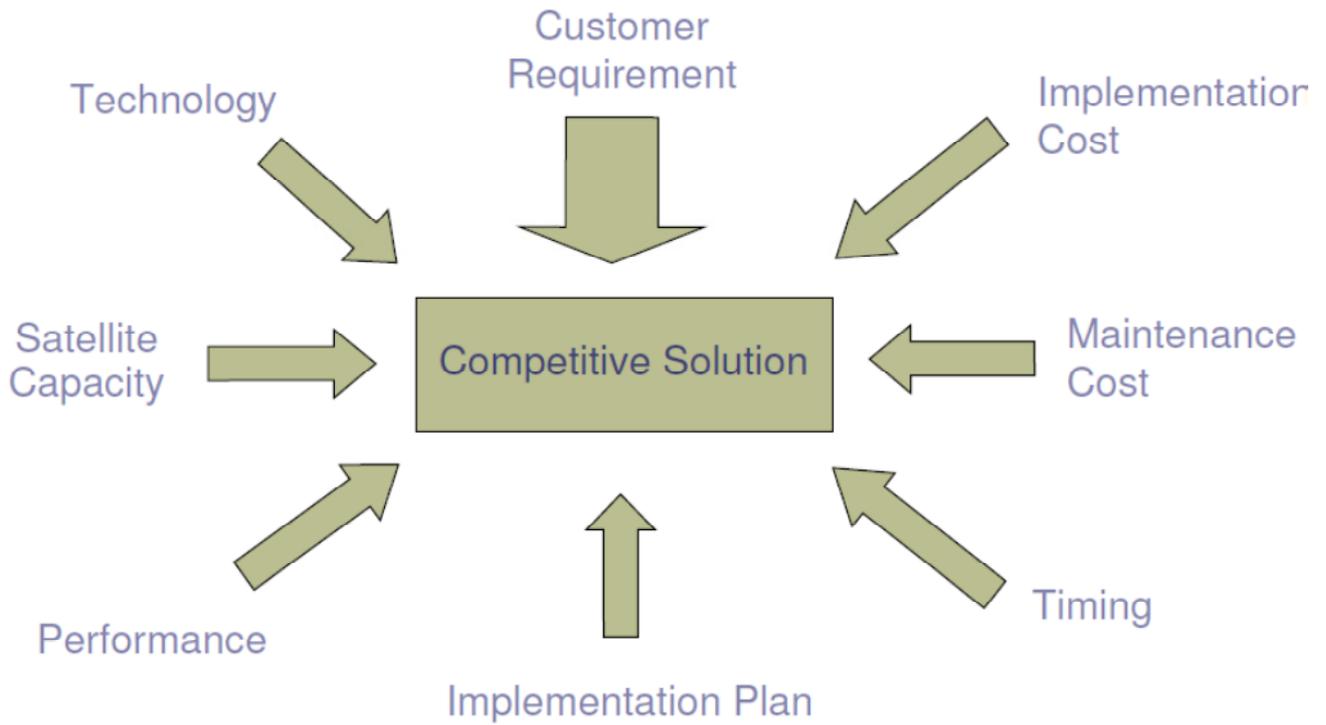
## **5.2 Equipment Maintenance and Spares Provisioning Requirements**

- **Plan for Maintenance, Repair and Replacement of Existing Equipment(Administrative and technical teams)**  
Develop a practical plan (with terms and conditions) to maintain, repair and replace any of the interconnection equipment.
- **Plan for Routine Equipment Maintenance and Emergency Repairs**

## **5.3 Technical assistance if any (case by case)**

APPENDIX I

# VSAT – Decision Drivers



### Example of Capital Cost Calculation for a VSAT System

	DESCRIPTION	PRICE	PRICE
	<b>Hub station</b>		This price depends on antenna size and hub
1	Equipment -fixed cost		
2	Spares		10 percent of spares for the hub
3	Facilities - Land, building		
4	Hub station fixed costs		
5	Interfaces - one per VSAT		This is the additional cost to install each VSAT to the existing hub equipment. The application can be either voice or data
6	Spares		
7	Hub station cost per VSAT		Multiply this value for the number of VSATs.
	<b>Operation's licensing</b>		
8	Hub station		Licensing fee for the hub.
9	First VSAT		Licensing fee for the first VSAT terminals.
10	Total initial licensing		
	<b>VSAT Station costs (each)</b>		
11	VSAT terminal		Equipment in the range of \$4,500 to \$15,000 depending on capacity. Receive only terminals in the \$1,200 to 2,500 range.
12	Spares		5 percent for VSAT equipment.
13	Site Survey		To determine the antenna location and potential RF interference to/from the VSAT.
14	Sites Installation		Includes antenna mount, antenna assembly, power installation and intrasite cabling. Prices can range from \$1,000 to \$ 3,000 depending on VSAT antenna size.
15	Commissioning tests		Acceptance testing includes the transmission of a test signal from the VSAT and the testing of the interfaces.
16	Terminal licensing		Cost of individual VSAT license fee.
17	Total Vsat cost		Except the space segment. This price has to be multiplied by the number of VSATs.
18	shipping handling and Insurance		Estimated in 10 percent of the equipment cost and based on 100 VSAT terminals.
19	Documentation		
20	Training		Including travel, lodging, and per diem for xx people.
21	Special Items		
	<b>Total</b>		