



INTERNATIONAL CIVIL AVIATION ORGANIZATION

**TWELFTH MEETING OF THE NAFISAT SUPERVISORY BOARD
(MAHE, SEYCHELLES, 20-21 SEPTEMBER 2017)**

Agenda Item 7: NAFISAT Upgrade Progress Report

(Presented by ATNS)

<p style="text-align: center;">SUMMARY</p>
<p>This working paper discusses the progress made to date in respect of the upgrade of the NAFISAT VSAT Network and certain implications that have been identified.</p>
<p>References:</p> <p>Report of the 12th NAFISAT Supervisory Board meeting</p>

1. Background

1.1 At the 8th NAFISAT Supervisory Board meeting it was agreed that the state of art ND Satcom MF-TDMA technology will be used for the network upgrade. The equipment can provide connectivity for existing legacy application as well as the planned ICAO IP based applications e.g. AMHS.

1.2 The NAFISAT AND SADC VSAT2 upgrade project were split in two parts:

Phase 1: Included the equipment acquisition of the SkyWAN IDU7000 MF-TDMA technology platform from ND Satcom; and

Phase 2: The appointment of a local contractor for the

- Delivery;
- conducting of site surveys;
- drafting of the site upgrade specifications;
- physical installation of the upgrade equipment; and
- refurbishment of equipment

ATNS managed and participated in the above tasks and was further responsible for:

- final setting-up;
- commissioning of the terminal equipment;
- transfer of operation to the upgraded network; and
- training of technical staff from each country.

Phase 1 of the project was effectively on time but challenges were experienced during Phase 2 of the upgrade project. This resulted in delays to the initially committed commissioning timeframe. However, it is important to note that the old network continued to provide safe and reliable services.

2. Discussion

2.1 Implementation Schedule Timeline

2.1.1 The initial timeline for the implementation of the upgrade is shown in Diagram A in Attachment A, which was presented to the previous NAFISAT Supervisory Board meeting. In summary, it indicated the high-level phases of the project with completion of the:

- Equipment manufacture by 26 February 2016; and
- Completion of Installation by 1 September 2016

Diagram B of Attachment A, shows the actual implementation time, which by comparison, shows the delays for the:

- Equipment manufacture by 11 March 2016: 11 working days late; and
- Completion of Installation by 16 March 2017: 141 working days late.

The following considerations had an impact on the schedule resulting in the delays:

2.1.2 NAFISAT and SADC VSAT 2 required to be upgraded at the same time because of the interconnectivity and the utilization of the main management centre in Johannesburg and the standby in Entebbe.

2.1.3 To prevent the need to retain any obsolete equipment the objective was to transfer all the sites at the same time.

2.1.4 It was assumed that all NAFISAT and SADC VSAT2 sites will be accessible to carry out the site surveys, delivery and upgrade installations. .

2.2 Installation and Commissioning Schedule

2.2.1 The installations work were completed during Calendar Week 10 (6 to 10 March 2017), as shown in Attachment B/1. There are several reasons for the delay of 141 working days. The main reasons are listed below.

2.3 Access to Sana'a and Saudi Arabia

2.3.1 The initial implementation schedule assumed that all sites will be accessible to do site surveys. During the project, it became clear that Sana'a and Saudi Arabia would not be installed in time. At the 11th NAFISAT Supervisory Committee Meeting during 10 to 11 October 2016, a Realistic Scenario was presented where ATNS were allowed the opportunity to conduct site surveys, delivery and installation of Sana'a and Saudi Arabia by the end of February 2017. It was decided that should this not materialise ATNS will proceed with the transition of services to the upgraded network at the end of February 2017, while retaining Sana'a and Saudi Arabia on the old network.

2.4 Delivery time of equipment

2.4.1 A number of States required inspections of the equipment at the OEM, the issue of licences for importation, etc. This caused delays in the case of the DRC and ATNS had to introduce mitigations to limit effect of the delays.

2.5 Obtaining of Letters of Invitation

2.5.1 This was mostly due to communication and administrative issue in most cases, and it caused delays for specific installations.

2.6 Incorrect delivery of equipment

2.6.1 The VSAT terminal for Somalia is situated in Nairobi, at the Flight Information Services of Somalia (FISS) operations control centre, however due to an error by the shipper the upgrade equipment was delivered to Mogadishu. The equipment could not be recovered and although the shipper accepted responsibility for all additional costs incurred, it inevitably caused delays. ATNS had to implement a mitigation plan to minimise the resultant delay.

2.7 Transition of Services to the Upgraded Networks

2.7.1 Transition from the old network was conducted on 16 March 2017 Both the NAFISAT and SADC VSAT2 networks were upgraded simultaneously so as to ensure interconnectivity between the two networks, particularly the following links, Khartoum, Nairobi, Entebbe and Victoria on the NAFISAT network and between Johannesburg, Dar es Salaam, Plaisance, Antananarivo, Kinshasa and Kigali on the SADC2 network.

2.7.2 The transitions were scheduled to take place between 18h00 – 20h00 and 20h00 - 24h00 GMT to minimize the service interruption. Both networks were completed during the scheduled times despite a few technical issues which were quickly resolved.

2.8 Present state of affairs

2.8.1 Attachment B/2 and B/3 shows the present state of the transition. 32 AFTN and 41 ATS/DS circuits were transferred. 11 AFTN and 16 ATS/DS circuits at Jeddah and Sana'a were not transferred at the time.

2.8.2 The site survey in Saudi Arabia has since been conducted and it is foreseen that the terminal will be upgraded shortly.

2.8.3 The 6 AFTN and 4 ATS/DS links to the AFISNET sites, highlighted in yellow, in the Attachments B/2 and B/3, were also not upgraded to ensure continuity of services until the AFISNET network is upgraded.

2.9 Conclusion of Transition

2.9.1 The majority of circuits have been transferred successfully on 16 March 2017. It should be noted that services for the circuits that have not been transferred will continue to operate on the old network until the issues are resolved.

2.10 Retention of interconnectivity with AFISNET

2.10.1 The NAFISAT sites that interconnect with AFISNET are indicated in Attachment C (NAFISAT highlighted in yellow)

2.10.2 These circuits were retained in the upgrade. The AFISNET network has not been upgraded yet and consequently the Datum MCPC (SCPC) modems and obsolete Memotec FAD equipment had to be retained at the interconnecting NAFISAT sites.

2.10.3 The risk of maintaining the obsolete Memotec equipment used in the NAFISAT network will be mitigated through the number of additional Memotec units available after the upgrade.

2.10.4 Additionally, ASECNA has indicated that they are planning to upgrade all their AFISNET Memotec equipment with NetPerformer devices. The upgrading of the AFISNET modems however, is still subject to a decision by the AFISNET Satellite Network Management Committee (SNMC).

2.11 Training of SADC & NAFISAT Technical Personnel

2.11.1 The ATNS Training Academy VSAT training equipment was upgraded and new training material developed based on the new ND Satcom SkyWAN IDU7000 modem and NetPerformer Frame Relay Access Device (FAD).

2.11.2 The initial detailed training of technicians from the NAFISAT and SADC2 states commenced on June 2016 and was completed in April 2017. The States that have received training to date are shown in Attachment D. Saudi Arabia and Yemen will be hosted in future courses.

2.11.3 In addition, all technicians received basic on-site training during the installation phase. This training ensured that the transition from the old to the new network was accomplished without any significant interruptions to the services.

2.12 Additional work required by NAFISAT States

2.12.1 ICAO has requested ATNS to make provision for the relocation of the Somali terminal from Kenya to Mogadishu. ATNS has commenced with the planning of this work which is scheduled to be completed early in 2018. It should be noted that the cost of this additional work must be carried by the individual State.

2.13 Implications

2.13.1 Due to the fact that all links on the NAFISAT and SADC2 networks could be upgraded, the following should be noted:

2.13.2 In the short term services on the non-upgraded links should not deteriorate as ATNS has sufficient Memotec and IDU5000 equipment to continue with the maintenance of these SADC and NAFISAT terminals. It could however become a risk in the long term as this equipment is obsolete.

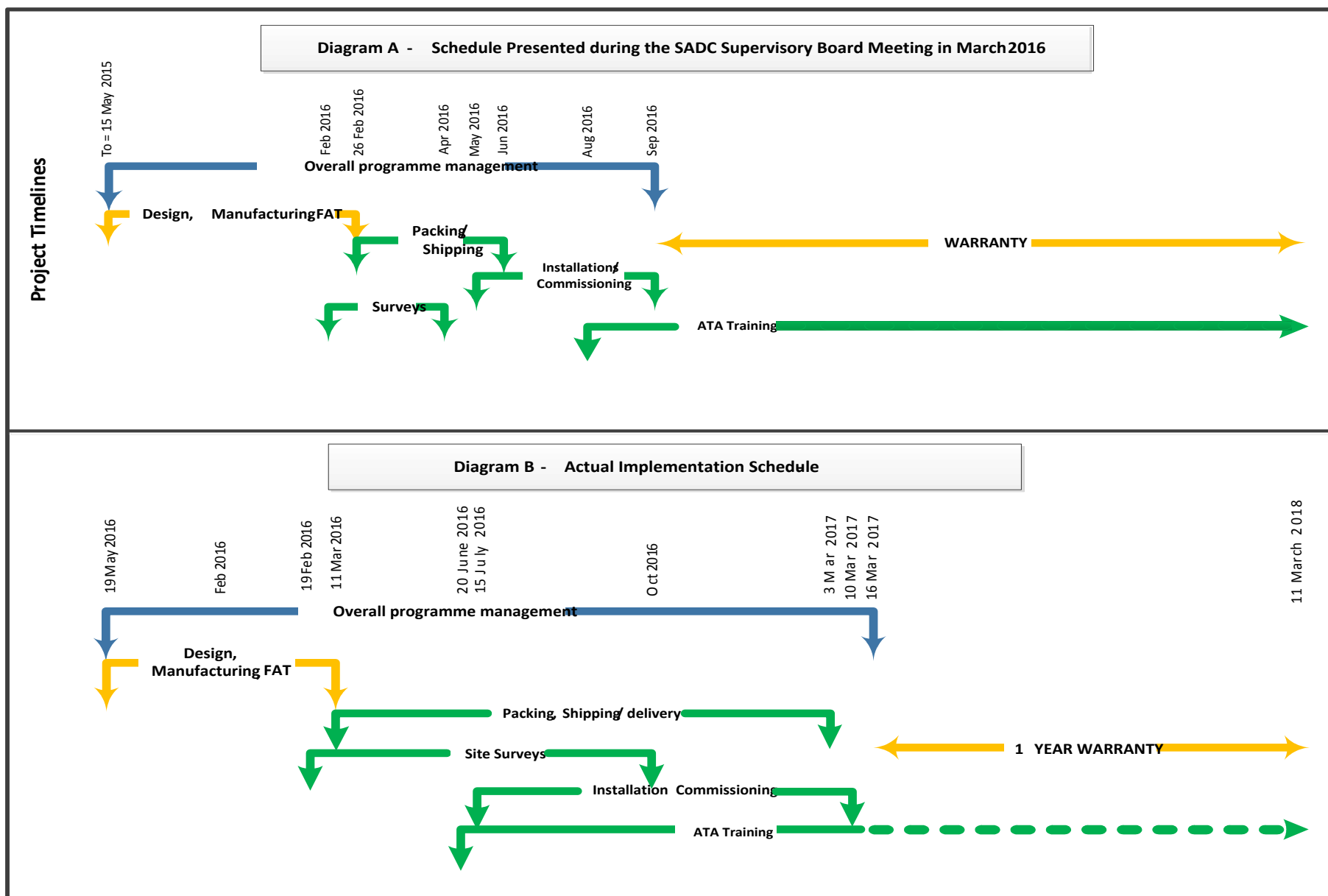
2.13.3 An amount of satellite spectrum has been retained for the old network. The optimization of the satellite spectrum for the new network can therefore not be completed until all the terminals in the NAFISAT networks has been transferred to the new network.

2.13.4 These implications will also be discussed in another Working Paper in regard to the Yemen upgrade.

3. Recommendations

It is requested that:

- a) The meeting take note of the progress made in respect of the upgrade of the NAFISAT network.
- b) Take note of the implication in paragraph 3, foreseen because of continued operation of both the old and the upgraded networks.



NAFISAT & SADC VSAT2 Upgrade (Transfer of Operation)

[illegible]

Scenario 2: Target Network Transfer

Transition
16 March 2017

Legend

- Legend**
-  - Completed
-  - Outstanding

Notes

- 1) Shipment issue
- 2) Return to finalise Snag List - does not affect operation
- 3) Site access issue

NAFISAT : AFTN

NEW OLD

Addis-Ababa	Djibouti	X	
	Jeddah		X
	Khartoum	X	
	Nairobi	X	
	Niamey		X

Asmara	Addis-Ababa	X	
	Cairo	X	
	Khartoum	X	

Cairo	Asmara	X	
	Jeddah		X
	Khartoum	X	
	Nairobi	X	
	Tripoli	X	

Djibouti	Addis-Ababa	X	
	Nairobi	X	

Entebbe	Nairobi	X	
	Jhb	X	

Nairobi	Addis-Ababa	X	
	Brazaville		X
	Cairo	X	
	Dar-es-Salaam	X	
	Djibouti	X	
	Entebbe	X	
	Jeddah		X
	Johannesburg	X	
	Mogadishu	X	
	N'djamena		X
	Plaisance	X	
	Sana'a		X
	Victoria	X	

Sana'a	Jeddah		X
	Nairobi		X

NEW OLD

Tripoli	Cairo	X	
	N'djamena		X
	Niamey		X
	Khartoum	X	

Victoria	Johannesburg	X	
	Nairobi	X	

Jeddah	Addis-Ababa		X
	Cairo		X
	Khartoum		X
	Sana'a		X

Khartoum	Addis-Ababa	X	
	Asmara	X	
	Cairo	X	
	Jeddah		X
	N'djamena		X
	Tripoli	X	

Mogadishu	Nairobi	X	
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AFTN Circuits		
Transferred to new network		32
On old network	Not transferred	11
	AFISNET	6
Total circuits		49

Attachment B/3

NAFISAT : ATS/DS

NEW OLD

Addis-Ababa	Asmara	X	
	Djibouti	X	
	Khartoum	X	
	Mogadishu	X	
	Nairobi	X	
	Sana'a		X

Asmara	Addis-Ababa	X	
	Djibouti	X	
	Jeddah		X
	Khartoum	X	
	Sana'a		X

Cairo	Jeddah		X
	Khartoum	X	
	Tripoli	X	

Djibouti	Addis-Ababa	X	
	Asmara	X	
	Mogadishu	X	
	Sana'a		X

Entebbe	Dar-es-Salaam	X	
	Khartoum	X	
	Kigali	X	
	Kinshasa	X	
	Nairobi	X	

Nairobi	Addis-Ababa	X	
	Dar-es-Salaam	X	
	Entebbe	X	
	Khartoum	X	
	Mogadishu	X	

Sana'a	Addis-Ababa		X
	Asmara		X
	Djibouti		X
	Jeddah		X
	Mogadishu		X

NEW OLD

Tripoli	Cairo	X	
	Khartoum	X	
	N'djamena		X
	Niamey		X

Victoria	Antananarivo	X	
	Dar-es-Salaam	X	
	Mogadishu	X	
	Nairobi	X	
	Plaisance	X	

Jeddah	Asmara		X
	Cairo		X
	Khartoum		X
	Sana'a		X

Khartoum	Addis-Ababa	X	
	Asmara	X	
	Brazzaville		X
	Cairo	X	
	Entebbe	X	
	Jeddah		X
	Kinshasa	X	
	Nairobi	X	
	N'djamena		X
	Tripoli	X	

Mogadishu	Addis-Ababa	X	
	Djibouti	X	
	Nairobi	X	
	Sana'a		X
	Victoria	X	

ATS/DS Circuits

Transferred to new network		41
On old network	Not transferred	16
	AFISNET	4
Total circuits		61

AFISNET Circuits

NAFISAT & SADC Terminals connected to AFISNET	AFTN	ATS/DS
Tripoli	Niamey N'Djamena	Niamey N'Djamena
Khartoum	N'Djamena	N'Djamena Brazzaville
Addis Ababa	Niamey	
Nairobi	Brazzaville	
Luanda	Brazzaville Accra	Brazzaville Accra Abidjan Dakar
Kinshasa	Brazzaville	Brazzaville

TRAINING AT ATA (Johannesburg) : NAFISAT		
COUNTRY	SITE NAME	No of delegates
DJIBOUTI	DJIBOUTI	1
EGYPT	CAIRO	1
ERITREA	ASMARA	1
ETHIOPIA	ADDIS ABABA	2
KENYA	NAIROBI	2
LIBYA	TRIPOLI	1
SAUDI ARABIA	JEDDAH	
SUDAN	KHARTOUM	2
SOMALIA	MOGADISHU	1
SEYCHELLS	VICTORIA	2
UGANDA	ENTEBBE & MMC	2
YEMEN	SANA'A	
Total		15

TRAINING AT ATA (Johannesburg) : SADC VSAT2		
COUNTRY	SITE NAME	No of delegates
TANZANIA	DAR ES SALAAM	2
RWANDA	KIGALI	2
DRC	KINSHASA	2
MADAGASCAR	ANTANANARIVO	2
MOZAMBIQUE	BEIRA, MAPUTO	2
BURUNDI	BUJUMBURA	2
ZAMBIA	LUSAKA	2
ANGOLA	LUANDA	1
MALAWI	LILIONGWE	2
BOTSWANA	GABORONE	2
ZIMBABWE	HARARE	2
SWAZILAND	MANZINI	2
LESOTHO	MASERU	2
MAURITIUS	PLAISANCE	2
NAMIBIA	WINDHOEK	2
Total		29

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