



ICAO

**INTERNATIONAL CIVIL AVIATION ORGANIZATION
EASTERN AND SOUTHERN AFRICAN (ESAF) OFFICE**

**THE FIFTEENTH VIRTUAL MEETING OF THE NAFISAT SUPERVISORY BOARD
(NAFISAT-SVB/15) (14 – 15 JULY 2021)**

Agenda Item 2: Operation, maintenance and performance of NAFISAT VSAT Network

(Presented by ATNS)

SUMMARY

This paper summarizes the operation, maintenance and performance of the NAFISAT network.

References:

- FRC Call Records
- Interconnectivity between adjacent Networks
- Network Availability
- AFTN cct Availability
- ATS/DS cct Availability
- Yearly comparative availability
- **AMHS implementation**

1. Background

- 1.1. This report presents the operational performance and maintenance of the NAFISAT network for the period April 2019 to March 2021. The report covers the availability of all services provided by the network, and these are measured against the agreed SLAs. Furthermore, the robustness of the maintenance strategy implemented by ATNS is reflected in the summary of trends observed throughout the reporting period and the statistics of incident reports received through the ATNS Fault Reporting Centre (FRC).
- 1.2. The FRC is located at the Johannesburg ACC and provides a 24 hr remote service for reporting and resolution of faults. The summary of the calls (reported incidents) are also given for the period April 2019 to March 2021. AFTN data services

2. Discussion

- 2.1. The successful maintenance of the VSAT network would not be possible without the continuous commitment and assistance of the NAFISAT member States and their personnel. The worldwide pandemic posed challenges to the Network and the skills obtained by all States' participants at the ATA training proved to be fruitful in order to ensure that the reported faults were dealt with timeously.

- 2.2. Timely on-site response by ATNS personnel remains vital to the successful maintenance of the Network. Travel restrictions and COVID protocols at the Different States restricted the movement of ATNS personnel to do site visits. This function was performed by the local Staff during the respective lockdowns. Remote preventative activities was scheduled and coordinated between ATNS and Staff to keep the terminals operating and restored where failures were detected.
- 2.3. With the lifting of travel bans and ease of COVID restrictions ATNS personnel are able to travel to some sites which were identified during the latest remote preventative maintenance activities, bringing those terminals to full redundant operations.
- 2.4. It should be noted that now, more than before assistance is required with the issuance of LOI's, VISAS, some customs processes and site access permits required by some authorities. These factors remain a risk to quick on-site response and availability of spares.

2.5. **NAFISAT FRC faults reported** (April 2019 to March 2020)

Total: FRC =152

	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Total
FRC	10	8	16	9	9	16	14	19	14	14	14	9	152
Corrective	5	6	13	5	8	7	7	15	10	9	10	8	103
Preventative	0	0	0	0	1	1	2	0	0	1	1	0	6
External	5	2	3	4	0	8	5	4	4	4	3	1	43

Summary Statistics	
Corrective	103
Preventative	6
External	43

2.6. NAFISAT FRC faults reported (April 2020 to March 2021)

Total: FRC =107

	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Total
FRC	8	7	5	5	10	13	4	13	8	6	10	18	107
Corrective	5	4	4	3	6	11	3	8	6	4	9	8	71
Preventative	0	0	0	0	0	0	0	0	0	0	0	7	7
External	3	3	1	2	4	2	1	5	2	2	1	3	29

Summary Statistics	
Corrective	71
Preventative	7
External	29

2.7. Yearly comparative FRC reported call totals

Year	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total	109	156	200	159	171	103	115	152	107

2.8. Trends

2.8.1. RF Switches, FPS's and RFT's were recorded as trend failures. ATNS identified the same trends towards the end of the term of the previous contract before upgrade was concluded.

2.8.2. Currently the failures are dealt with through the normal fault and spares management process.

2.8.3. Should any new developments or trends arise, ATNS will follow the necessary processes to maintain the network to the previous and current standard.

2.9. Interoperability

2.9.1. Seamless operations, interoperability and interconnectivity between VSAT networks in the AFI Region remains crucial and ATNS remains committed to implement the best practices as recommended by ICAO. The NAFISAT and SADC VSAT2 networks are fully integrated to ensure continuation of seamless operation by being fully interconnected and interoperable on level 1.

- 2.9.2. At present interconnectivity between AFISNET and NAFISAT is achieved on level 3 through baseband equipment. These connections have been problematic for a while now and reached a point where some of the services have failed. These are AFTN services to Brazzaville, Ndjamena and Niamey.
- 2.9.3. ATNS and ASECNA have agreed to the platform for the links. The links will continue to be achieved through the DATUM 500L series. The multiplexers are now changed to the NETPERFORMER FAD and configuration for these FAD units have been agreed upon. Implementation is underway where the stations connecting to AFISNET will install cabling and configuration to enable connectivity to the DATUM modems. Implementation and transition of services will then be coordinated between the affected State and ASECNA.
- 2.9.4. The availability of these links and services are recorded as follows:

Network		2019/2020	2020/2021	2021/2022	
Khartoum/Niamey		99,99	100	99,93	
Khartoum/N'Djamena		99,99	100	99,93	
Addis/Niamey		99,98	100	99,93	
Nairobi/Brazzaville		99,94	99,83	99,93	
Khartoum/Brazzaville		99,99	100	99,93	
Tripoli/Niamey		0	0	0	
Tripoli/N'Djamena		0	0	0	
Average Tripoli included		71,412857	71,404286	71,378571	71,39%
Average achieved		99,978	99,966	99,93	99,96%

Note 1: Due to the terminal being off in Libya, the availability is heavily affected. The achieved availability of the links; i.e. level 1 and 2 are within specification above 99.9%

ATS	2019/2020	2020/2021	2021/2022
Niamey/Addis	N/A	N/A	N/A
Niamey/Tripoli	6,39	0	0
N'Djamena/Khartoum	99,57	100	99,93
N'Djamena/Nairobi	N/A	N/A	N/A
N'Djamena/Tripoli	6,39	0	0
Brazzaville/Nairobi	N/A	N/A	N/A
Brazzaville/Khartoum	99,55	99,99	99,93

Note 2: The availability of the voice circuits are acceptable operating on average above 99%

AFTN		2019/2020	2020/2021	2021/2022
Niamey/Addis		99,98	100	99,93
Niamey/Tripoli		6,39	0	0
N'Djamena/Khartoum		99,94	87,5	50
N'Djamena/Nairobi		99,95	87,42	0
N'Djamena/Tripoli		6,39	0	0
Brazzaville/Nairobi		99,39	99,83	0

Note 3. The availability of the AFTN services are deteriorating and are operating below acceptable levels.

Performance of the Network

2.10. Data was collated from April 2019 to March 2021 and is presented to the meeting for information.

(PRESENTATION)

2.11. Network operational availability (April 2019 to March 2020)

NETWORK AVAILABILITY (%)											
Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
98.05	91.67	91.56	91.65	91.66	91.62	91.63	91.67	91.65	91.62	91.64	91.66

Average = 92.17%

2.12. Network operational availability (April 2020 to March 2021)

NETWORK AVAILABILITY (%)											
Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
91.66	91.67	91.17	91.67	91.61	91.53	91.54	91.54	91.51	91.54	91.43	91.34

Average =91.52%

These percentages represent all outages including all exclusions as per the bilateral agreements where all delays are calculated. Some of these are logistical delays, political situations, acts of nature etc.

2.13. Network achieved availability (April 2019 to March 2020)

NETWORK AVAILABILITY (%)											
Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
99.99	100	99.89	99.98	99.99	99.95	99.97	100	99.98	99.95	99.97	100

Average = 99.97%

2.14. Network achieved availability (April 2019 to March 2020)

NETWORK AVAILABILITY (%)											
Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
100	100	99.89	99.98	99.99	99.95	99.97	100	99.98	99.95	99.97	100

Average = 99.96%

These percentages represent outages which does not include the exclusions but includes the preventative maintenance outages.

2.15. AFTN circuit availability (April 2019 to March 2020)

AFTN CIRCUIT AVAILABILITY											
Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
97.56	86.19	85.89	86.18	86.18	86.13	86.42	86.25	86.62	86.40	86.62	86.67

Average = 87.26%

2.16. AFTN circuit availability (April 2020 to March 2021)

AFTN CIRCUIT AVAILABILITY											
Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
86.20	86.19	86.00	86.20	86.02	86.07	86.07	86.00	85.99	86.10	86.01	85.84

Average = 86.06%

2.17. ATS/DS circuit availability (April 2019 to March 2020)

ATS/DS CIRCUIT AVAILABILITY											
Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
98.10	89.19	89.03	89.15	89.17	89.10	89.14	89.07	88.77	89.11	89.14	88.88

Average = 89.82%

2.18. ATS/DS circuit availability (April 2020 to March 2021)

ATS/DS CIRCUIT AVAILABILITY											
Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
89.18	89.19	88.26	89.18	89.09	88.96	88.96	89.02	88.97	89.03	88.91	88.85

Average = 88.97%

2.19. MMC AVAILABILITY (April 2019 to March 2020)

MMC AVAILABILITY											
Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
100	100	100	100	100	100	100	100	100	100	100	100

Average = 100%

2.20. MMC AVAILABILITY (April 2020 to March 2021)

MMC AVAILABILITY											
Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
100	100	100	100	99.93	99.91	100	100	100	100	99.98	100

Average = 99.99%

2.21. AMHS circuit availability (April 2020 to March 2021)

AMHS AVAILABILITY											
Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
9.99	10	10	10	10	9.99	9.99	9.97	10	13.32	16.66	16.65

Average = 11.38%

2.22. Implementation of AMHS service on the NAFISAT network

NAFISAT	Site 1 / HP SW	Site 2 / HP SW	Active Yes /No	REMARKS
	Jeddah	Cairo	Y	NATTING done by both sites
Jeddah	Addis	Planned		
Jeddah	JHB	Planned		
Addis	JHB	Planned		
Nairobi	JHB	Y	implemented	
Nairobi	Dar Es Salaam	Planned		
Entebbe	Nairobi	Configured	working, Enetbbe will adz working	
Nairobi	Mogadishu	Test	Setup and Testing with software assistant / redundancy IP issue	
Nairobi	Plaicance	Configured	Awaiting implementation	

Data collected on Services for the period between April 2019 to March 2020

Number of Voice calls = 710 228

Number of Bytes transmitted = 6,451,224,138

2.23. Data collected on Services for the period between April 2020 to March 2021

Number of Voice calls = 227 942

Number of Bytes transmitted = 4,617,219,466

2.24. Yearly comparative availabilities

Network Availability									
Year	2013	2014	2015	2016	2017	2018	2019	2020	2021
Average	99,94	99,97	99,93	99,97	99,98	99,97	99,97	99,97	99,96

Average =99.96%

AFTN Availability									
Year	2013	2014	2015	2016	2017	2018	2019	2020	2021
Average	99,69	96,58	97,41	97,62	98,91	98,41	98,43	87,26	86,06

Average =95.60%

Yearly ATS/DS availability

ATS/DS Availability									
Year	2011	2012	2013	2014	2015	2016	2017	2018	2019
Average	99,75	97,37	97,68	96,56	99,2	99,15	98,36	89,82	88,97

Average = 96.32%

3. Distribution of statistics

- 3.1. Distribution of statistics is done on a monthly basis.
- 3.2. Statistics are published monthly on the ATNS website for State Members to view. Member states receive an e-mail alert that the statistics are available on the website.
- 3.3. ATNS continuous to provide the level 4 statistics as required from ICAO on a monthly basis.

4. ACTION TO BE TAKEN BY THE MEETING

- 4.1. The meeting is invited to take note of the above information. More information on specifics will be made available upon request.
- 4.2. States are requested to submit the statistics recorded on the level 4 template to ATNS for the completion of the document to be sent to ICAO.
- 4.3. Relevant States are requested to assist in timeously supplying Letters of Invitation and all States are requested to assist in resolving difficulties experienced at the respective customs for the clearing and releasing of equipment and spares as well as the facilitation to access the site during maintenance.

- 4.4. States are encouraged to implement AMHS services as per the ICAO block Upgrades and the network proposed design.
- 4.5. States are reminded to follow the fault reporting procedure and report all NAFISAT network faults to the ATNS FRC on +27 11 928 6477 or frc@atns.co.za and to copy to the Manager ruip@atns.co.za.