



# **NIGERIAN AIRSPACE MANAGEMENT AGENCY CIRCUIT AVAILABILITY REPORT FOR SNMC/26 MEETING**

**19-23 NOVEMBER 2018  
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## Introduction

**Nigerian Airspace Management Agency (NAMA)** is the sole Air Navigation Service Provider (ANSP) in Nigeria with the vision to be one of the leading ANSP in the World and with mission to provide safe efficient and economic Air Navigation Service to airspace users through deployment of new technology and dedicated workforce.

For the reliability of the aeronautical fixed and mobile services in the Accra, Brazzaville, Kano, N`djamena, and Niamey FIR, a satellite telecommunication network for central and western Africa named initially AEROSATEL and now AFISNET was initiated by ICAO and funded by the European Union (EU).



It was implemented by Alcatel Telspace from 1992 to 1995. In Nigeria, Kano and Lagos have one Intelsat standard B earth stations (Antenna of 11m) each and six Intelsat standard F2 earth stations (Antenna of 7.3m) in Abuja, Ilorin, Jos, Maiduguri, Port-Harcourt and Sokoto. The stations operates on C-band (6/4 GHz) through IBS carriers at 64kb/s using  $\frac{3}{4}$  forward error coding on IS 10-02. The stations facilitates transfer of voice and data air traffic information with other stations within the network and additionally provide coverage for extended range VHF communication in Nigeria for domestic ATC operation. See Figure 1 for the AFISNET networks.

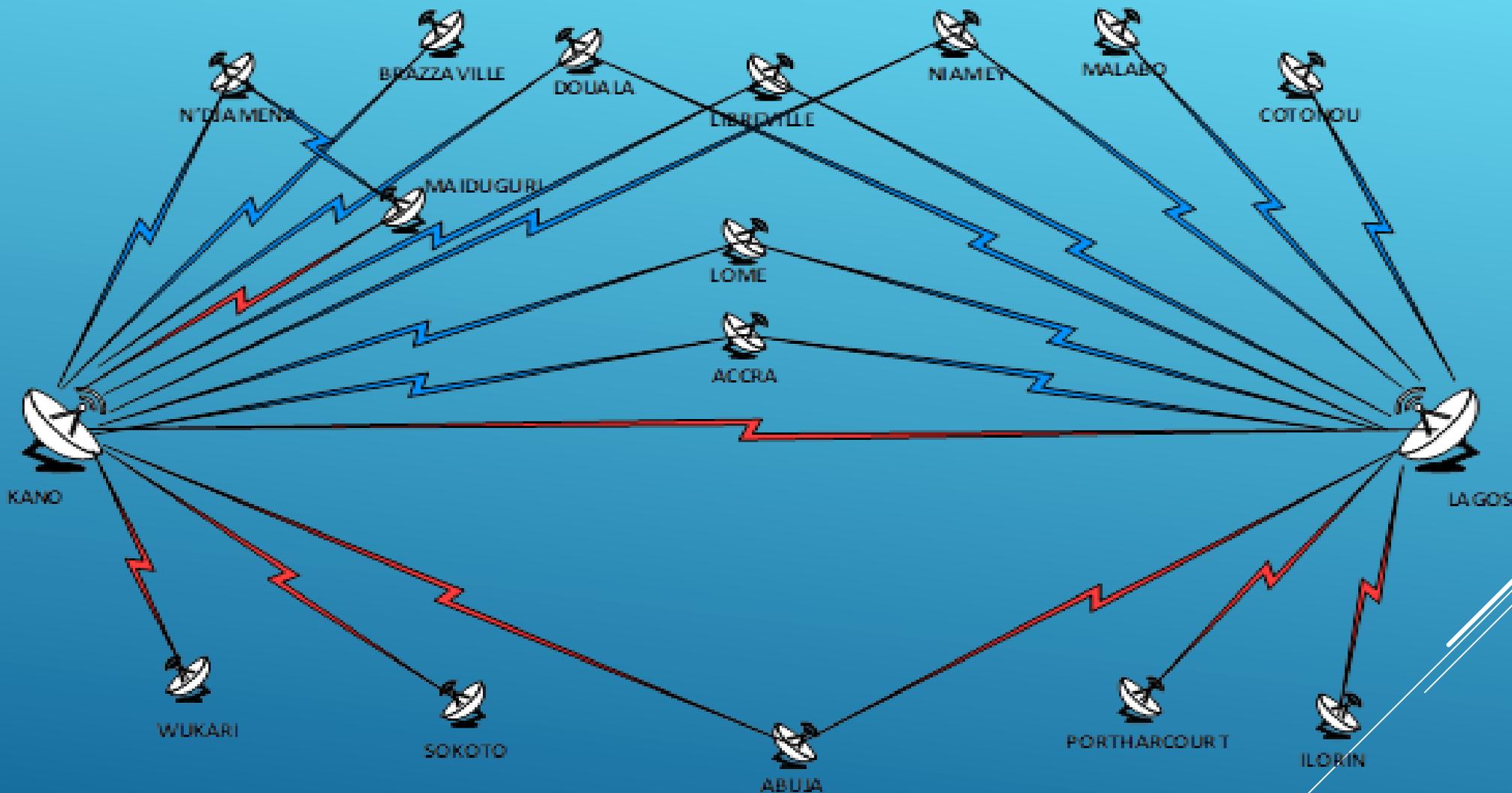


Figure 1: Nigeria`s AFISNET Aeronautical Satellite Network



After the site acceptance and commissioning in 1995, the earth stations have undergone the following transformation:-

- The upgrading and optimization of legacy Alcatel (S+Dx) base band unit to Multiplexer (Mol 2P) to increase the AFTN data speed from 50 to 1200 bauds for National link and 2400 bauds for International link. There was provision of additional voice engineering service telephone for maintenance coordination.
- The obsolete 286 processor of the AFTN terminal were also upgraded with Pentium terminals to improve data processing which enhances quick service delivery.



- The 500W High Power Amplifier (HPA) and 125W Varian Amplifiers were replaced with Solid State Power Amplifier (SSPA) 200 and 50 Watts. The change has reduced energy consumption rate and also removed the problem for searching very expensive and scarce traveling wave tube (TWT).
- In November 2004, the stations migrated from IS 903 @ 325.5 degree east to IS10-02 @ 359 degree east to harmonized and integrate stations for seamless and effective communication.
- Paradise MODEM, an integrated unit has replaced the Alcatel MODEMs and U/D Converters designed based on modular architecture.



## Maintenance Management

The objective of maintenance is to avoid failure. It is inevitable that parts might wear and lose their specification, which makes performance to deteriorate. If this is not amended rationally, it may affect the quality of service or could even result to serious irreversible failure. We carried out daily operational and preventive maintenance. Checks of different parameters are made by testing and taking measurements, which are recorded on the maintenance sheet.



## Equipment Operational Status

The earth stations is operational even though it has become has become very obsolete. The success is attributed to perfect cooling systems, steady power supply, conducive environment and competent maintenance personnel.



## Availability report

Air traffic services supported are :-

- Aeronautical Fixed Telecommunication Network (AFTN).
- Air Traffic Services/Direct Speech (ATS/DS).

The percentage availability for the months of January – October 2018 are represented diagrammatically below ;



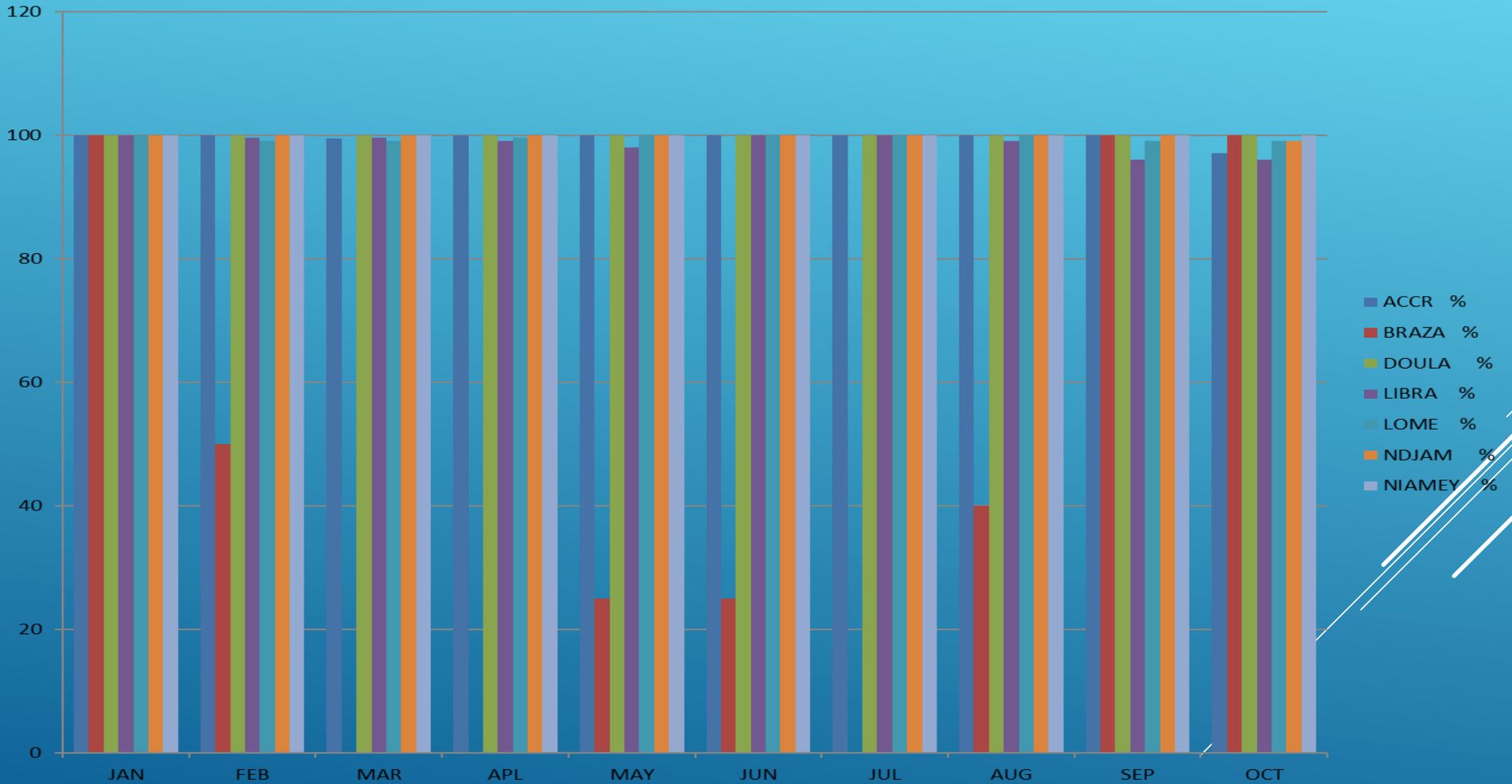


## THE PERCENTAGE CIRCUIT AVAILABILITY TABLE FOR AFTN LAGOS

CIRCUIT / MONTH	ACCRA	COTONOU	DOUALA	LIBREVILLE	LOME	MALABO	NIAMEY
JAN 2018	0%	99.5%	99.5%	99.5%	99.5%	0%	99.5%
FEB 2018	0%	99.5%	99.5%	99.5%	99.5%	0%	99.5%
MAR 2018	100%	100%	100%	100%	99.7%	0%	100%
APR 2018	100%	100%	100%	100%	100%	0%	100%
MAY 2018	99.8%	99.8%	99.7%	99.3%	98.9%	0%	99.9%
JUNE 2018	100%	87.9%	100%	100%	99.6%	0%	100%
JUL 2018	100%	99.4%	100%	100%	98.7%	0%	100%
AUG 2018	100%	100%	95.6%	95.6%	100%	0%	95.6%
SEP 2018	97.2%	97.2%	97.2%	97.2%	93.4%	0%	99.2%
OCT 2018	99.3%	100%	100%	100%	98.9%	0%	100%



# THE CIRCUIT AVAILABILITY GRAPH FOR AFTN KANO



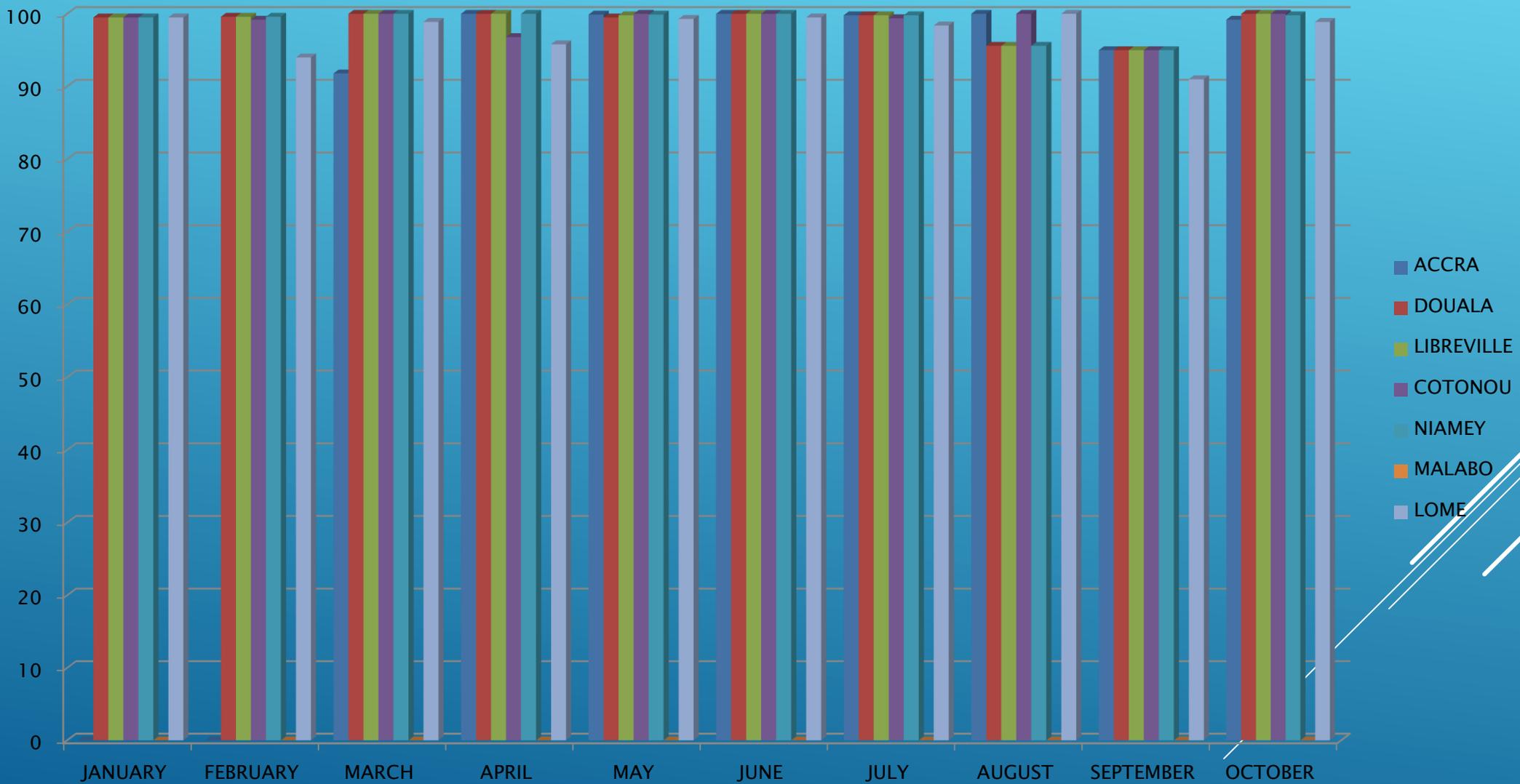


## THE PERCENTAGE AVAILABILITY TABLE FOR AFTN KANO

STATION	ACCR	BRAZA	DOULA	LIBRA	LOME	NDJAM	NIAMEY
MONTH	%	%	%	%	%	%	%
JAN	100	100	100	100	100	100	100
FEB	100	50	100	99.5	99	100	100
MAR	99.4	0	100	99.5	99	100	100
APL	100	0	100	99	99.5	100	100
MAY	100	25	100	98	100	100	100
JUN	100	25	100	100	100	100	100
JUL	100	0	100	100	100	100	100
AUG	100	40	100	99	100	100	100
SEP	100	100	100	96	99	100	100
OCT	97	100	100	96	99	99	100



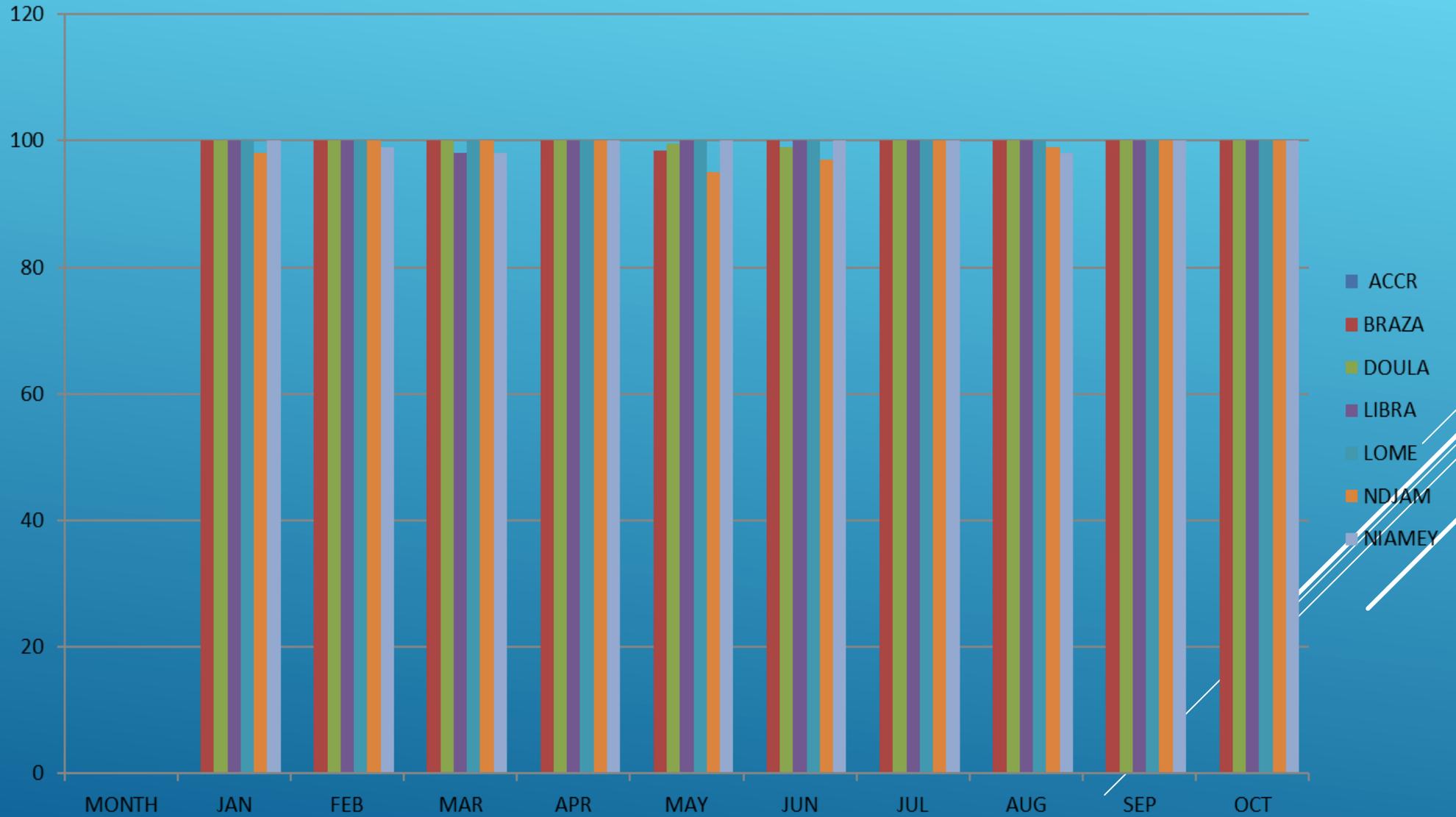
## THE PERCENTAGE AVAILABILITY GRAPH FOR ATS/DS LAGOS







## THE PERCENTAGE AVAILABILITY GRAPH FOR ATS/DS KANO







## Challenges/Remedy

**21<sup>st</sup> January 2018**

**Activity:** Routine maintenance carried out at the Earth Station at 0626UTC-0950UTC

**14<sup>th</sup> February**

**Activity:** Earth station shut down for maintenance purpose. The Aftn link for local and international stations were unavailable for 3 hours

**30<sup>th</sup> March**

**Fault :** Lomé frame relay was down at 0915UTC – 1000UTC

**Action taken :** Reset was done on Mol2P and modem. Link came up thereafter



## Challenges/Remedy

**29<sup>th</sup> May, 2018**

**Fault:** Douala Modem indicated major alarm and its frame relay link port on Lag2 Mol2p DOWN from 1030UTC- 1220UTC

Cotonou modem indicated major alarm and its frame relay link port on lag3 Mol2p DOWN

**Action taken:** Douala and Cotonou technicians were contacted through Lome ASECNA officer ( Mr Joel) who informed NAMA duty officer that outdoor routine maintenance was being carried out in Douala while there was atmospheric condition (thunder storm) in Cotonou affecting the link.



## Challenges/Remedy

### 4 June

**Fault:** Cotonou complained of not receiving Lagos AFTN since June 1

**Action taken:** Issue was traced to broken db9 connection. The connector was soldered and link was serviceable at 1450UTC

### 11th July

**Fault:** Cotonou frame relay down due to bad weather 0845UTC – 1200UTC

**Action taken:** Link came up as weather improved



## Challenges/Remedy

### 16th August

**Fault:** Douala, Libreville and Niamey link down as mol2p was off due to faulty power pack 2333UTC(16/08) – 0800UTC(18/08)

**Action taken:** A new power pack 3KTPRO power supply was adapted to work with existing 5KTPRO for LAG2 mol2p



# Challenges/Remedy

**17<sup>th</sup> Sep, 2018**

**Fault:** Earth station shut down due to the installation of a new 40kva on-line ups and the installation commence immediately from 1710UTC-1810UTC

**Action taken:** The earth station was powered up after the successful installation of the ups, all facilities came up afterwards.



# Challenges/Remedy

**18<sup>th</sup> AND 19<sup>TH</sup> Sep 2018**

**Fault:** Lome frame relay link was down from 0800UTC 18/09 to 1520UTC 19/09

**Action taken:** Lome officer contacted and LOME/LAGOS Mol2p reset at the same time, the frame relay link came up.



## Challenges/Remedy

**20<sup>th</sup> September**

**Fault:** The earth station was shutdown at 0000UTC to 1438UTC due to tripping of newly installed UPS

**Action taken:** The batteries of the UPS were allowed to charge sufficiently. A new AVR was installed. Power was restored afterwards.



## Challenges/Remedy

**17<sup>th</sup> October**

**Fault :** Lomé circuit frame relay link down and DLCI from 0950UTC – 1800UTC  
Accra circuit frame relay link down from 1205UTC -1810UTC

**Action taken:** Lomé DLCI was reset and the frame relay link became operational  
Accra frame relay was reset by resetting lag3 Mol2p



## Conclusion

The general operation and performance of Kano and Lagos circuits have been satisfactory. We look forward to the successful reengineering and modernization of the entire network meet up with the envisage future challenges.



**THANK YOU**

