



Twenty First Meeting of the Africa-Indian Ocean Planning and Implementation Regional Group (APIRG/21)
(Nairobi, Kenya, 9 – 11 October 2017)

Agenda Item 5: Regional Air Navigation Deficiencies

Industry Initiatives and other Air Navigation matters

MOBILE COMMUNICATIONS SURVEY REPORT

(Presented by International Air Transport Association)

SUMMARY	
<p>This paper presents the report on the last Aeronautical Mobile Communication survey in the AFI conducted by IATA from 8th to 22nd February 2017 that aims to:</p> <ul style="list-style-type: none"> • Determine the real VHF coverage and the quality of HF and CPDLC/SATCOM service provisions to users • Identify deficiencies and develop corrective action plans to be addressed with concerned States/ANSPs • Continue Efforts to address persistent Challenges • Support improvement of aeronautical mobile communication and the protection of the aviation frequency spectrum • Support improvement of quality and timely provisions of ground-to ground services in particular AIDC 	
<p>REFERENCE(S):</p> <ul style="list-style-type: none"> ▪ Annex 10 Volume II – Communication Procedures including those with PANS Status ▪ Doc 9750 Doc Global Air Navigation Plan 2016-2030 ▪ APIRG Procedural Handbook 	
<p>Related ICAO Strategic Objective(s)</p>	<p>This working paper related to the following Strategic Objectives:</p> <ul style="list-style-type: none"> ▪ Safety: Enhance global civil aviation safety ▪ Air Navigation Capacity and Efficiency: Increase the capacity and improve the efficiency of the global civil aviation system.

1. INTRODUCTION

1.1 IATA conducts Aeronautical Mobile Communications surveys in the AFI region every 18 months with an objective to determine real VHF coverage and the quality of HF and CPDLC/SATCOM service provision within the region, in order to identify deficiencies and arrive at corrective action plans to address them, in coordination with States and Air Navigation Service Providers (ANSPs).

1.2 The last survey was done on the 15th June to 28th June 2015 was presented to the Twentieth Meeting of the AFI Planning and Implementation Group (APIRG/20) in December 2015. The meeting commended IATA for its continued support to the assessment of air-ground communications performance in the AFI Region.

1.3 The present document provides an analysis of the data collected during the IATA survey of AFI Air/Ground VHF, HF and CPDLC/SATCOM communications performance and quality of Air Traffic Services from 8th to 22nd February 2017.

Airlines participation

1.4 The following airlines: Air France (AF), British Airways (BA), Delta Air Lines (DL), Emirates Airlines (EK), Etihad Airways (EY), KLM Royal Dutch Airlines (KLM), Lufthansa (LH) and Qatar Airways (QR), provided data representing 2055 VHF/HF and 1225 CPDLC reports on 40 ATS units, including 25 FIRs. The data covers most of the AFI Region.

Participation of States Air Traffic Services Units

1.5 Only the ATS Unit of Mauritius, participated in the survey has shared the survey results with the IATA. It is commendable that they have done this consistently over the years.

2. DISCUSSION/Summary of the results

2.1 The distribution of the survey data is as depicted in the chart below. VHF represented 72% (against 87% during the last survey) of the data received from airlines while HF represented 28% (against 13% during the last survey) (Fig 1). This may not represent the distribution of usage of VHF compared to HF in the AFI Region. However, at the individual FIR level, the proportion of the VHF and HF provides an indication on the use of VHF with respect to HF, with the exception of Mogadishu.

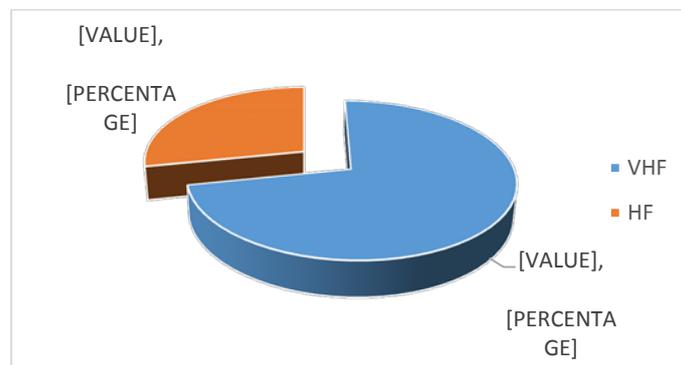


Figure 1: Distribution of survey data received for VHF and HF

2.2 Some FIRs namely Addis Ababa, Kinshasa, Luanda, Ndjamena and Niamey showed a slight level of HF usage indicating the unavailability of VHF in some part of the FIRs (Fig. 2). Despite the improvements to be pursued for the VHF coverage of Kinshasa FIR, we can note an improvement in the usage of VHF compared to HF (57 HF calls against 48 VHF calls during the last survey) due to tremendous investment in VHF and VSAT infrastructure. The rate of usage of the VHF and HF in Luanda FIR is still the same in comparison with the previous survey.

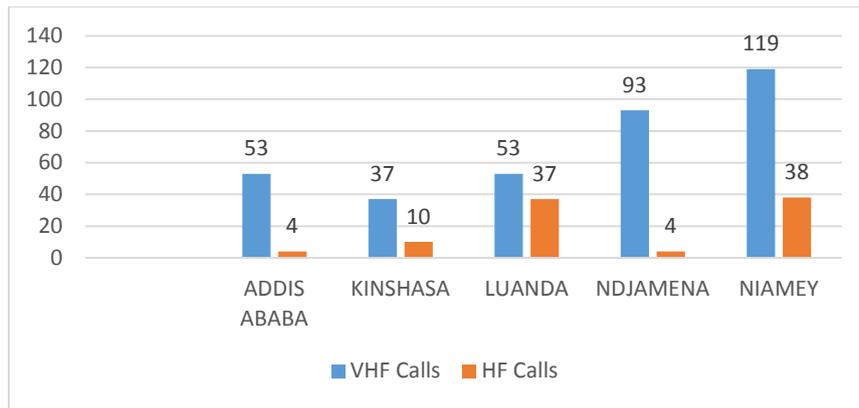


Figure 2: Distribution of VHF and HF calls for selected FIRs from the survey

2.3 The success rate of VHF communications exceeds 90% in Accra, Kinshasa and Mauritius FIRs. With the implementation of VHF performance monitoring programme, these 03 FIRs can reach the success rates of 100% achieved by Entebbe, Sal and Windhoek FIRs. The remaining FIRs still need to set rigorous VHF and HF performance monitoring programmes in order to improve the success rate of communications. With regards to HF communications, it is recommended the use of prediction tools like ICEPAC to improve the selection of HF frequencies to be used by ATC and pilots during a given period.

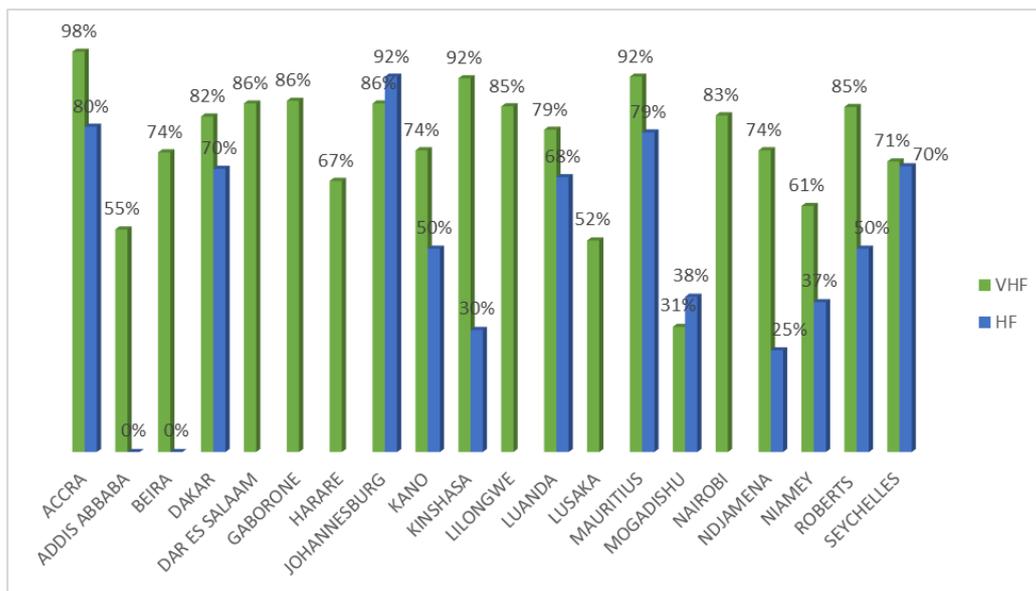


Figure 3: Distribution of VHF and HF success calls for selected FIRs from the survey

2.4 The figure below shows the CPDLC log-on attempts as well as the successful connections. On the total of 25 FIRs involved in this survey, only 13 FIRs have CPDLC, implemented and operational (Accra, Brazzaville, Cape Town, Dakar, Johannesburg, Kano, Luanda, Mauritius, Nairobi, Ndjamen, Niamey, SAL and Seychelles). During the survey, the following FIRs Johannesburg (86%), Luanda (91%), Mauritius (100%), Ndjamen (93%), SAL (100%) and Seychelles (95%) have recorded a good score of CPDLC log-on success. The remaining FIRs have obtained the log-on rate success between 59% and 72%, with the exception of Kano FIR, with the score 22%. We recommend the establishment of local Data-Link monitoring programmes as per ICAO Doc 9869 -PBCS Manual in order to improve CPDLC service provision. The figure 4 also shows the low level of the automatic transfer of flights between FIRs. This can be explained by the low level of AIDC implementation between adjacent centres.

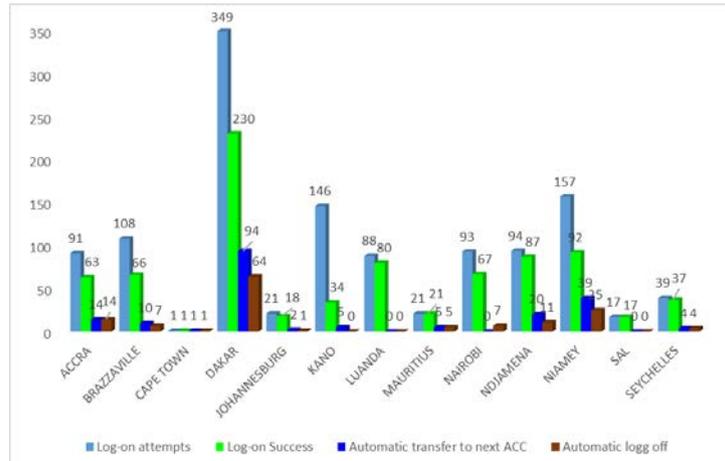


Figure 4: Distribution of CPDLC connection and Flight Transfers between ACC

2.5 The table below (figure 5) summarizes the VHF/HF and CPDLC/SATCOM usage and the respective success rate. The figures in the table have been arrived at the basis of the data received during the survey period and are indicative of the reality with regards to the operation of the infrastructure on the ground. SATCOM was mainly used in Mogadishu FIR due to unavailability of VHF and HF means.

FIR	Number of Calls			% Communication Success		% of Usage		CPDLC				SATCOM	
	VHF	HF	Total	VHF	HF	VHF	HF	Log-on attempts	Log-on Success	Automatic Transfer to next ACC	Automatic log-off	Number of Calls	Call Success
Accra	128	20	148	98%	80%	86%	14%	91	63	14	14	0	0
Addis Ababa	53	4	57	55%	0%	93%	7%	N/A	N/A	N/A	N/A	0	0
Beira	57	1	58	74%	0%	98%	2%	N/A	N/A	N/A	N/A	N/A	N/A
Brazzaville	114	1	115	85%	100%	99%	1%	108	66	10	7	1	0
Cape Town	1	0	1	100%	-	100%	0%	1	1	1	1	0	0
Dakar	297	56	353	82%	70%	84%	16%	349	230	94	64	0	2
Dar Es Salaam	49	0	49	86%	-	100%	0%	N/A	N/A	N/A	N/A	N/A	N/A
Entebbe	9	0	9	100%	-	100%	0%	N/A	N/A	N/A	N/A	0	0
Gaborone	22	0	22	86%	-	100%	0%	N/A	N/A	N/A	N/A	0	0
Harare	27	0	27	67%	-	100%	0%	N/A	N/A	N/A	N/A	0	0
Johannesburg	21	13	34	86%	92%	62%	38%	21	18	2	1	0	0
Kano	155	2	157	74%	50%	99%	1%	146	34	5	0	0	0
Kinshasa	37	10	47	92%	30%	79%	21%	N/A	N/A	N/A	N/A	0	0
Lilongwe	20	0	20	85%	-	100%	0%	N/A	N/A	N/A	N/A	0	0
Luanda	53	37	90	79%	68%	59%	41%	88	80	0	9	0	0
Lusaka	25	0	25	52%	-	100%	0%	N/A	N/A	N/A	N/A	N/A	N/A
Mauritius	13	14	27	92%	79%	48%	52%	21	21	5	5	N/A	N/A
Mogadishu	13	338	351	31%	38%	4%	96%	N/A	N/A	N/A	N/A	16	13
Nairobi	93	0	93	83%	-	100%	0%	93	67	0	7	N/A	N/A
Ndjamena	93	4	97	74%	25%	96%	4%	94	87	20	11	0	0
Niamey	119	38	157	61%	37%	76%	24%	157	92	39	25	0	0
Roberts	33	4	37	85%	50%	89%	11%	N/A	N/A	N/A	N/A	N/A	N/A
Sal	17	0	17	100%	-	100%	0%	17	17	0	0	0	0
Seychelles	7	37	44	71%	70%	16%	84%	39	37	4	4	1	1
Windhoek	20	0	20	100%	-	100%	0%	N/A	N/A	N/A	N/A	0	0
Total	1476	579	2055					1225	813	194	148	18	16

Figure 5: VHF/HF /CPDCL/SATCOM Usage and Success rate per FIR

2.6 **Notes**

Successful communication or VHF/HF success rate is described in this survey as:

- Radio Contact Status:
 - 0 – Failed
 - 1 – Extremely difficult
 - 2 – Difficult
 - 3 – Fair
 - 4 – Good
 - 5 – Excellent
 - N/A (when the radio contact failed)
- Readability
 - 1 – Unreadable
 - 2 – Readable now and then
 - 3 – Readable but with difficulty
 - 4 – Readable
 - 5 – Perfectly readable
 - N/A (when the radio contact failed)

2.8 A detailed analysis of the results by centre is provided at **Appendix** to this WP.

2.7 In line with the survey results presented above, IATA recommends the following conclusion with respect to the Implementation of Service Level Agreement (SLA) between Users and ANSPs to improve mobile communication service provision

AFI ANSPs that show deficiencies in mobile communication service provision, to establish Service Level Agreement (SLA) between Users and ANSPs and; collaboratively find out measures to address deficiencies that have been identified.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

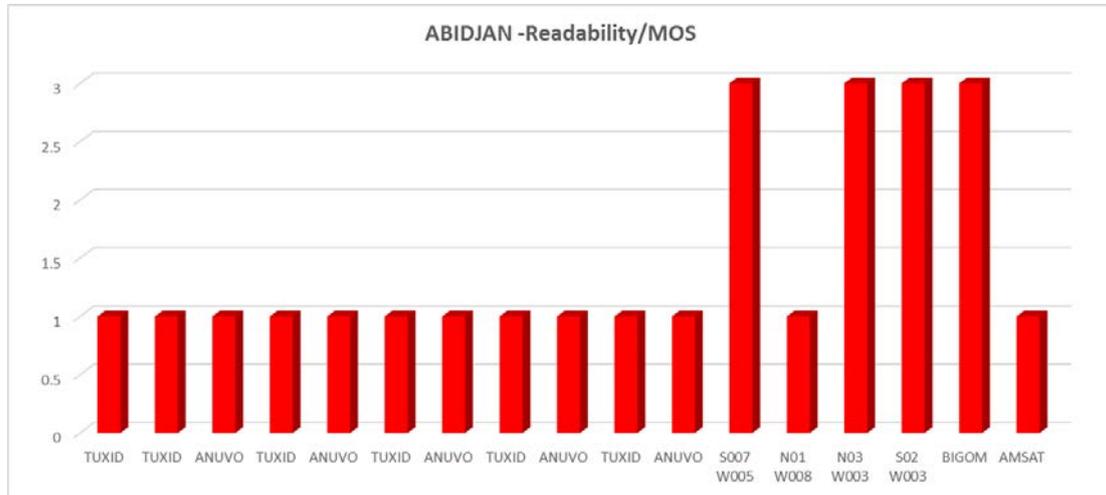
- i. note the results provided; and
- ii. consider the IATA recommendation mentioned in paragraph 2.8 of this WP as a pragmatic approach that will improve significantly the provision of mobile communication service within the AFI Region

2. -END-

APPENDIX

ANALYSIS OF THE RESULT BY CENTRE

Abidjan



VHF/HF

A total of 74 call attempts were made (51 on VHF and 23 on HF).

Success rate: VHF 51%, HF 30%

VHF calls at TUXID, ANUVO, BIGOM and AMSAT were poor and unreadable.

CPDLC

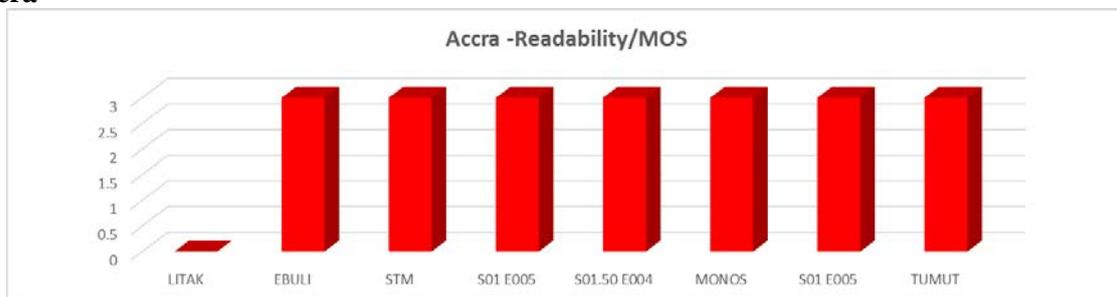
A total of 60 log-on attempts were made. Out of these, 99% had successful log-on. 18 CPDLC transfers to neighboring Centres using voice communication were made mainly to Atlántico and Lagos.

Abuja

VHF/HF and CPDLC

Not enough calls to provide any meaningful results

Accra



VHF/HF

A total of 95 call attempts were made (75 on VHF and 20 on HF).

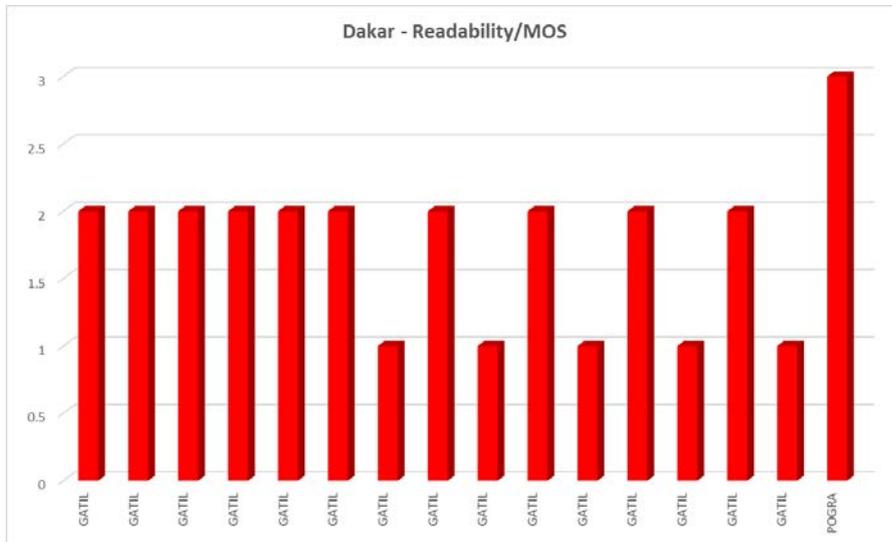
Success rate: VHF 97%, HF 80%

VHF calls at LITAK, EBULI, MONOS and TUMUT were poor and unreadable.

CPDLC

A total of 91 log-on attempts were made. Out of these, 69% had successful log-on. 14 CPDLC transfers to neighboring Centres using voice communication were made mainly to Abidjan, Dakar, Lagos and Ndjamená.

Dakar



VHF/HF

A total of 187 call attempts were made (154 on VHF and 33 on HF).

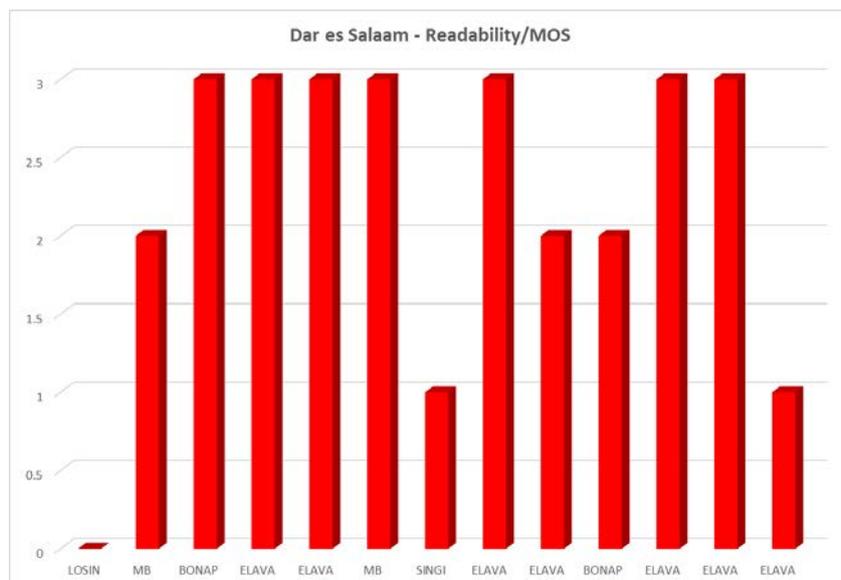
Success rate: VHF 90%, HF 97%

Calls at GATIL and POGRA were poor and unreadable.

CPDLC

A total of 185 log-on attempts were made. Out of these, 72% had successful log-on. 76 Automatic transfers to neighboring Centres were made.

Dar es Salaam



VHF/HF

A total of 49 call attempts were made on VHF.

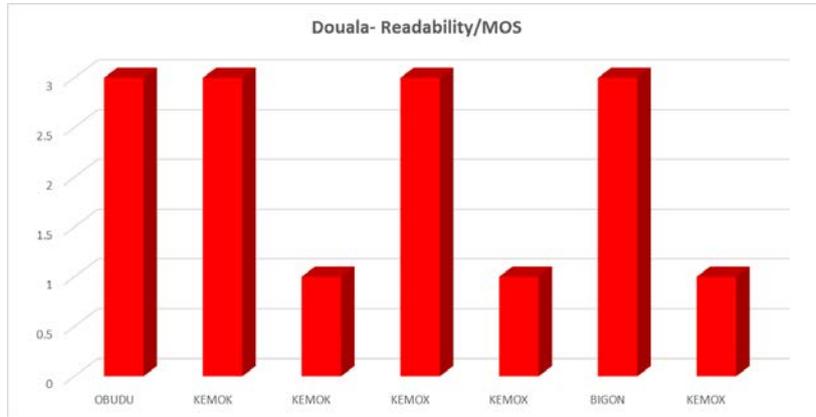
Success rate: VHF 86%

VHF calls at LOSIN, BONAP, ELAVA and SINGI were poor and unreadable.

CPDLC

CPDLC is not implemented in Dar es Salaam FIR.

Douala



VHF/HF

A total of 27 call attempts were made on VHF.

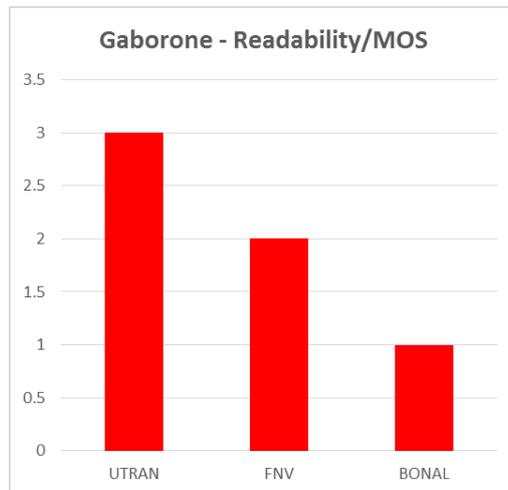
Success rate: VHF 89%

Calls at OBUDU, KEMOK and BIGON were poor and unreadable.

CPDLC

CPDLC is not implemented in Douala.

Gaborone



VHF/HF

A total of 22 call attempts were made on VHF.

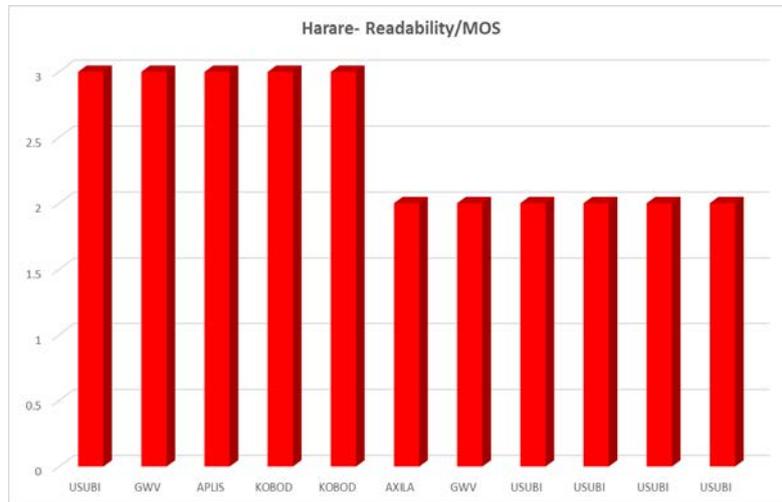
Success rate: VHF 86%

VHF calls at UTRAN and BONAL were poor and unreadable.

CPDLC

CPDLC is not implemented in Gaborone FIR.

Harare



VHF/HF

A total of 27 call attempts were made on VHF.

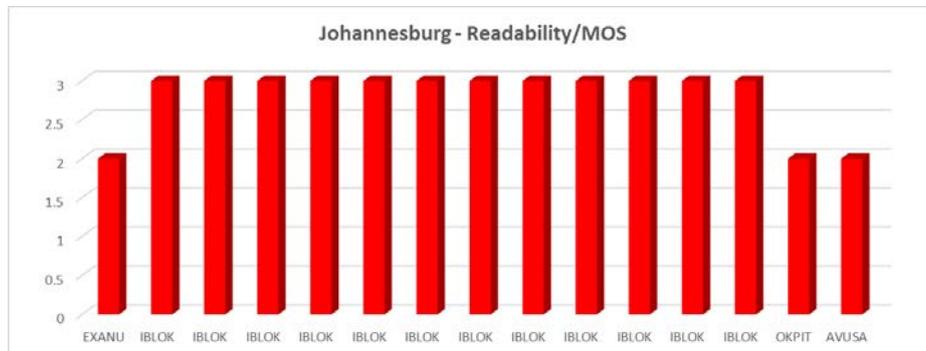
Success rate: VHF 67%

VHF calls at USUBI, KOBOD, APLIS and AXILA were poor and unreadable.

CPDLC

CPDLC is not implemented in Harare FIR.

Johannesburg



VHF/HF

A total of 34 call attempts were made (21 on VHF and 13 on HF).

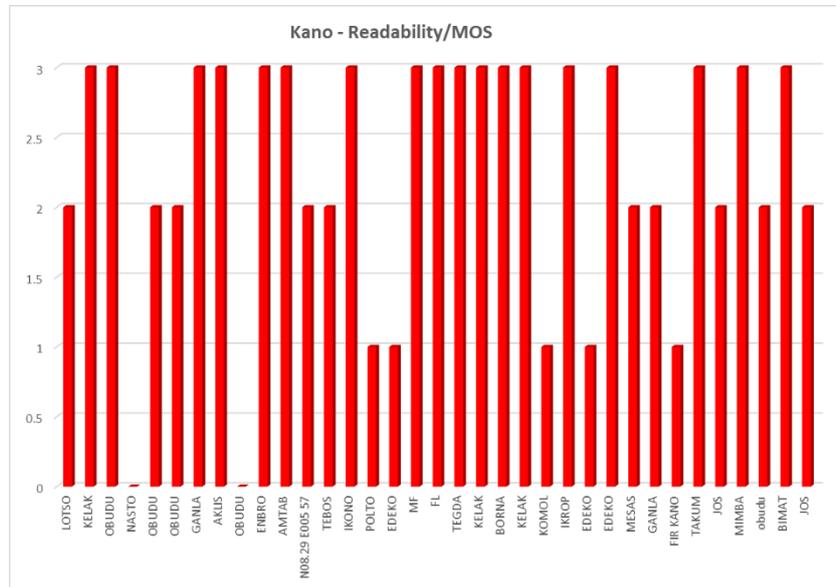
Success rate: VHF 86%, HF 92%

Calls at EXANU, IBLOK, OKPIT and AVUSA were poor and unreadable.

CPDLC

A total of 21 log-on attempts were made. Out of these, 86% had successful log-on. 2 CPDLC transfers to neighboring Centres were made using voice communications.

Kano



VHF/HF

A total of 71 call attempts were made (69 on VHF and 2 on HF).

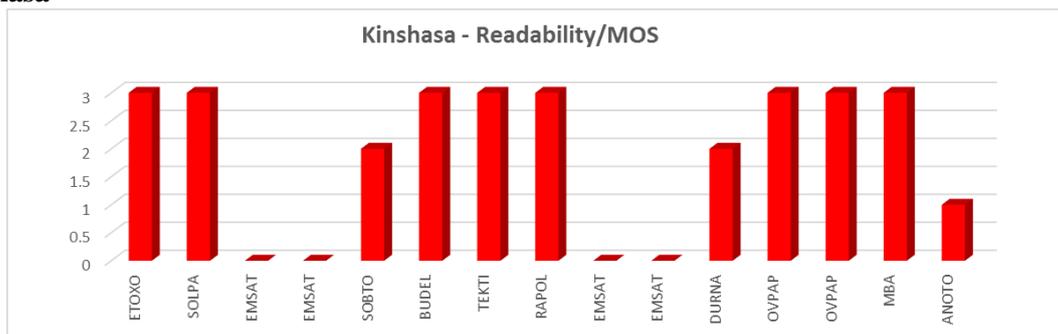
Success rate: VHF 67%, HF 50%

Calls at LOTSO, KELAK, OBUDU, NASTO, GANLA, AKLIS, ENBRO, AMTAB, TEBOS, IKONO, POLTO, TEGDA, BORNA, KOMOL, IKROP, EDEKO, MESAG, TAKUM, MIMBA and BIMAT were poor and unreadable.

CPDLC

A total of 65 log-on attempts were made. Out of these, 45% had successful log-on. 5 CPDLC transfers to neighboring Centres were made using voice communications.

Kinshasa



VHF/HF

A total of 47 call attempts were made (37 on VHF and 10 on HF).

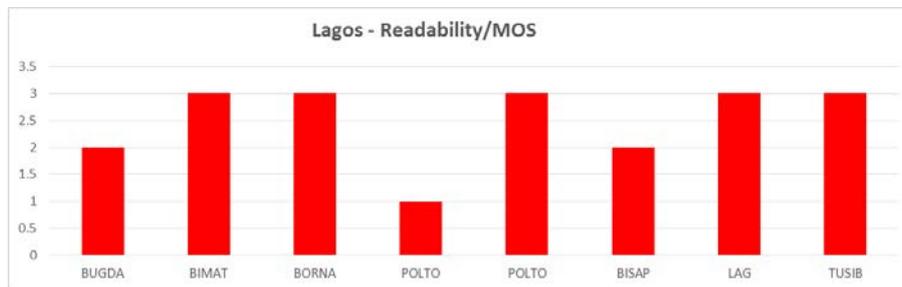
Success rate: VHF 92%, HF 30%

Calls at ETOXO, SOLPA, EMSAT, SOBTO, BUDEL, TEKTI, RAPOL, DURNA, OVPAP and ANOTO were poor and unreadable.

CPDLC

CPDLC is not implemented in Kinshasa FIR.

Lagos



VHF/HF

A total of 85 call attempts were made on VHF.

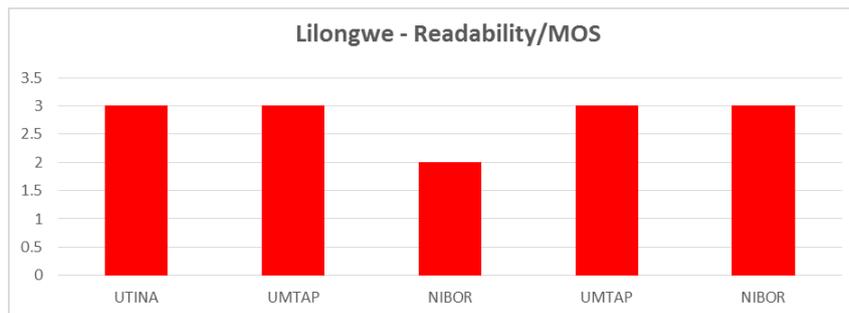
Success rate: VHF 80%

VHF calls at BUGDA, BIMAT, BORNA, POLTO, BISAP and TUSIB were poor and unreadable.

CPDLC

A total of 81 log-on attempts were made. Out of these, only 6% had successful log-on. No Automatic transfers to neighboring Centres were achieved.

Lilongwe



VHF/HF

A total of 20 call attempts were made on VHF.

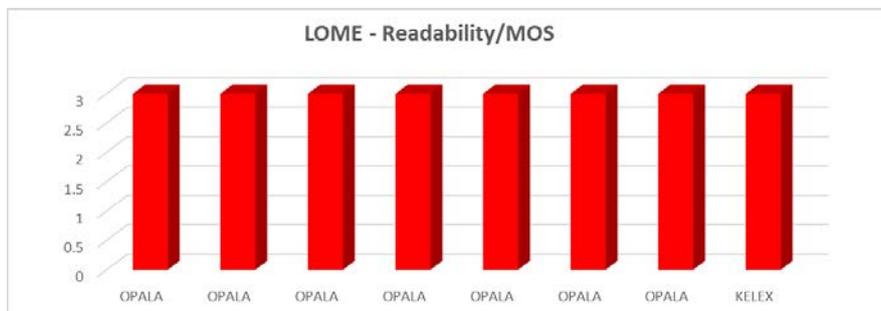
Success rate: VHF 92%

VHF calls at UTINA, UMTAP and NIBOR poor and unreadable.

CPDLC

CPDLC is not implemented in Lilongwe FIR.

Lomé



VHF/HF

A total of 53 call attempts were made on VHF.

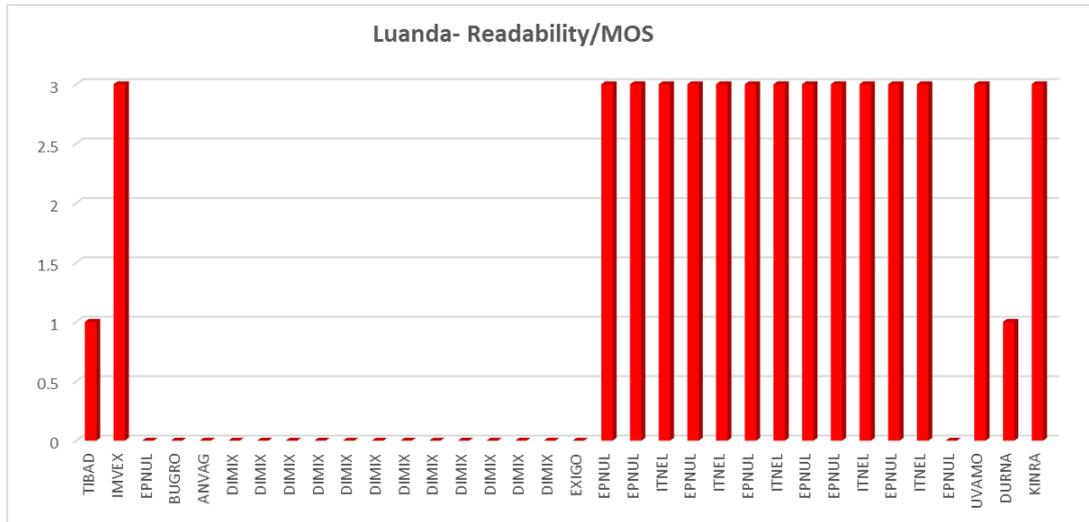
Success rate: VHF 100%

Calls at OPALA and KELEX were poor and unreadable.

CPDLC

CPDLC is not implemented in Lomé.

Luanda



VHF/HF

A total of 90 call attempts were made (53 on VHF and 37 on HF).

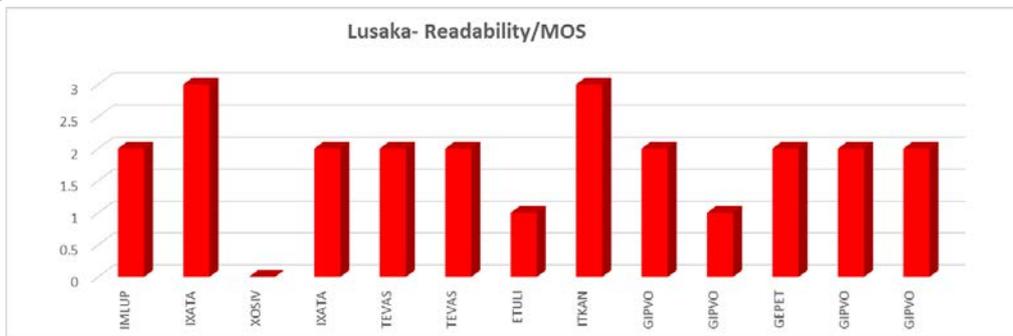
Success rate: VHF 79%, HF 68%

Calls at TIBAD, IMVEX, EPNUL, BUGRO, DIMIX, ITNEL, UVAMO, DURNA and KINRA were poor and unreadable.

CPDLC

A total of 88 log-on attempts were made. Out of these, 91% had successful log-on. No Automatic transfers to neighboring Centres were made.

Lusaka



VHF/HF

A total of 25 call attempts were made on VHF.

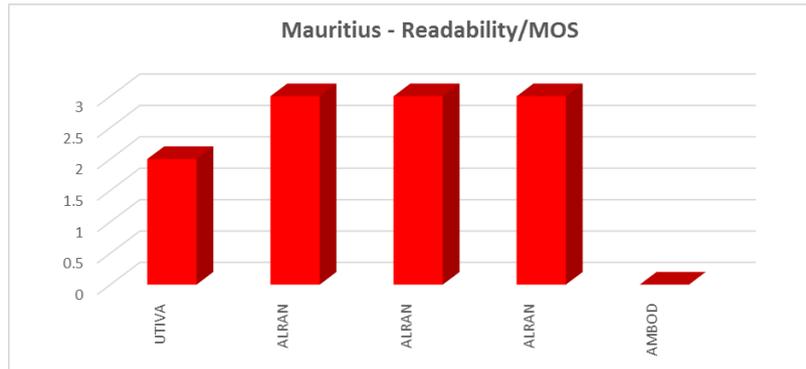
Success rate: VHF 52%

VHF calls at IMLUP, IXATA, XOSIV, TEVAS, ETULI, ITKAN, GIPVO and GEPET were poor and unreadable.

CPDLC

CPDLC is not implemented in Kinshasa FIR.

Mauritius



VHF/HF

A total of 27 call attempts were made (13 on VHF and 14 on HF).

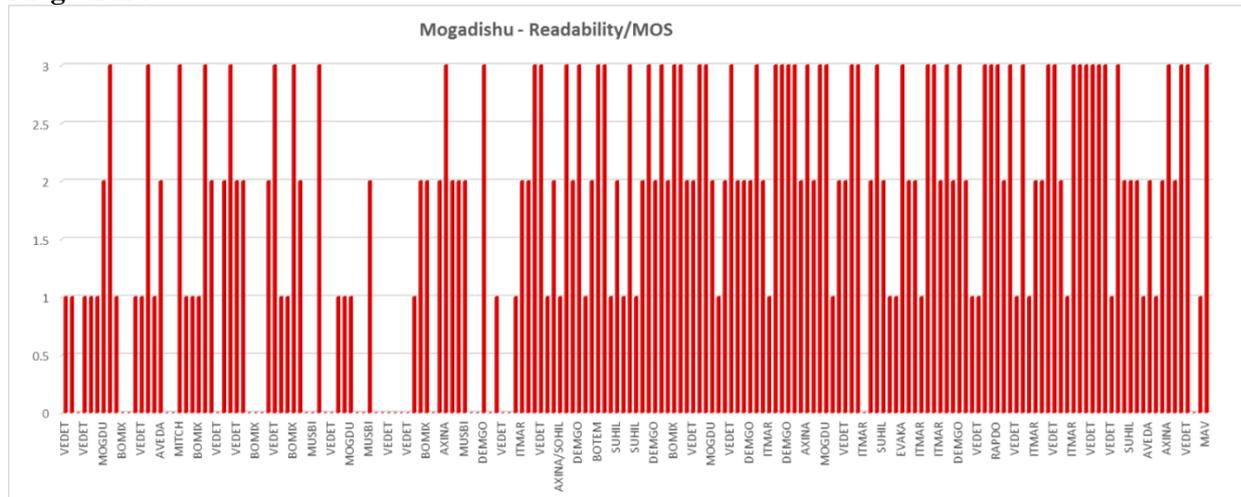
Success rate: VHF 92% and HF 79%

VHF calls at UTIVA, ALRAN and AMBOD were poor and unreadable.

CPDLC

A total of 21 log-on attempts were made. 100% had successful log-on and 5 CPDLC transfers to neighboring Centres were made using voice communications.

Mogadishu



VHF/HF

A total of 351 call attempts were made (13 on VHF and 338 on HF).

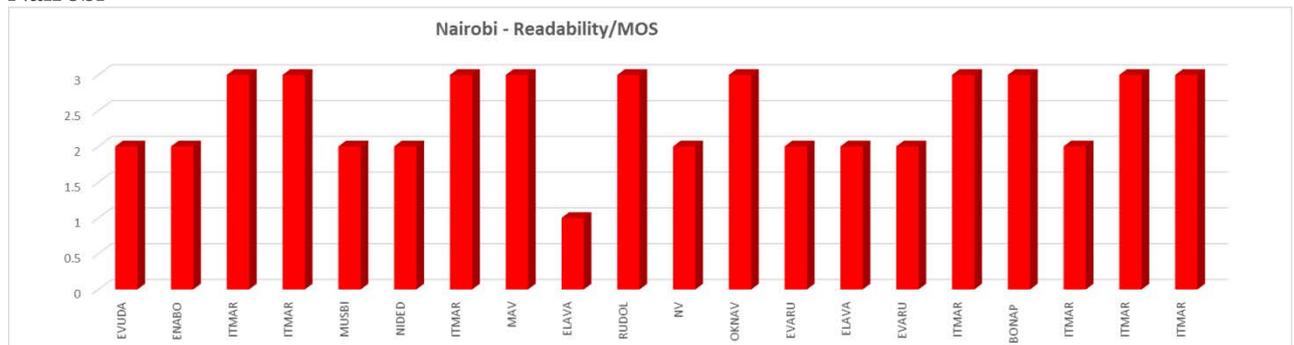
Success rate: VHF 31% and HF 40%

Calls at VEDET, BOMIX, AVEDA, MUSBI, AXINA, DEMGO, ITMAR, SUHIL, EVAKA and RAPDO were poor and unreadable.

CPDLC

CPDLC is not implemented in Mogadishu FIR.

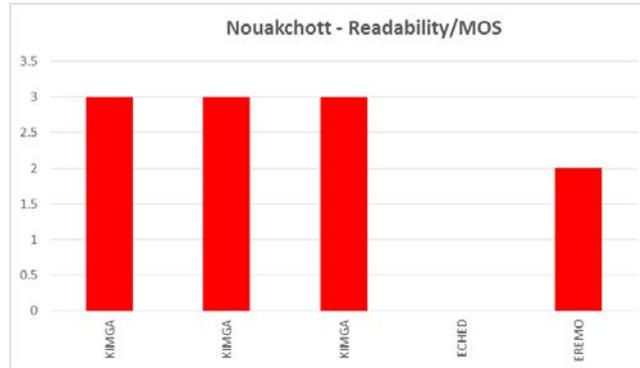
Nairobi



CPDLC

A total of 120 log-on attempts were made. Out of these, 67% had successful log-on and 30 Automatic transfers to neighboring Centres were made.

Nouakchott



VHF/HF

A total of 28 call attempts were made on VHF.

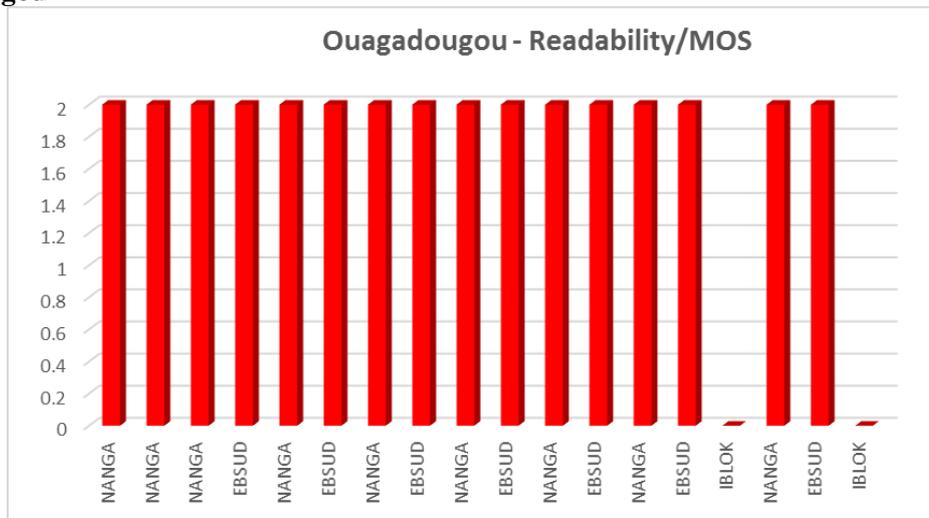
Success rate: VHF 93%

VHF calls at KIMGA, ECHED and EREMO were poor and unreadable.

CPDLC

A total of 27 log-on attempts were made. Out of these, 56% had successful log-on and no Automatic transfers to neighboring Centres were carried out.

Ouagadougou



VHF/HF

A total of 37 call attempts were made (35 on VHF and 2 on HF).

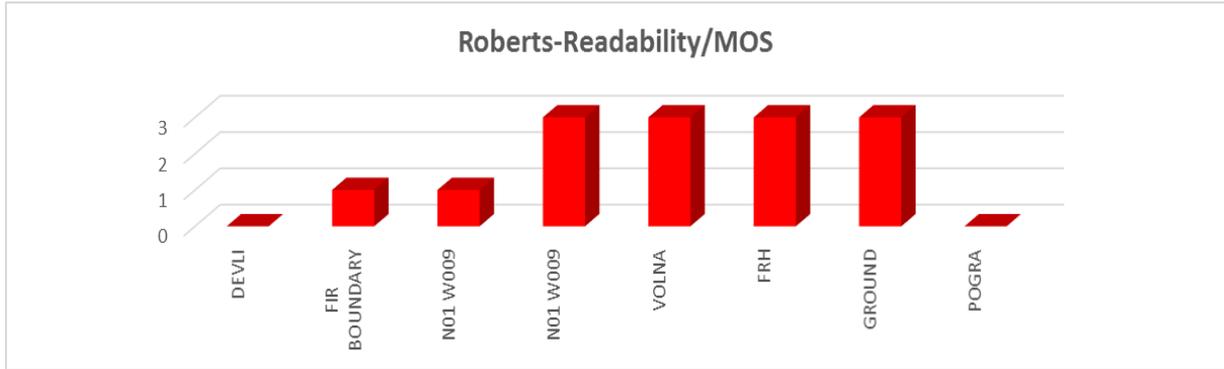
Success rate: VHF 54% and HF 0%.

VHF calls at NANGA EBSUD and IBLOK were poor and unreadable.

CPDLC

CPDLC is not implemented is not implemented in Ouagadougou.

Roberts



VHF/HF

A total of 37 call attempts were made (33 on VHF and 4 on HF).

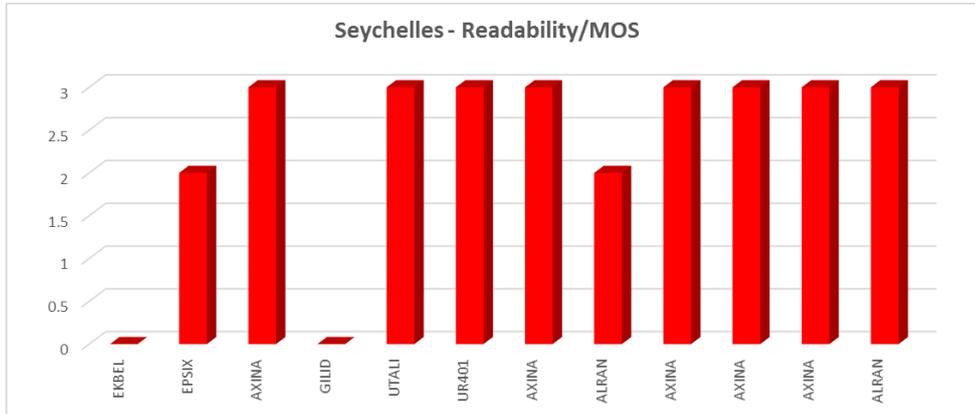
Success rate: VHF 85% and HF 50%

Calls at DEVL, VOLNA and POGRA were poor and unreadable.

CPDLC

CPDLC is not implemented in Roberts FIR.

Seychelles



VHF/HF

A total of 44 call attempts were made (7 on VHF and 37 on HF).

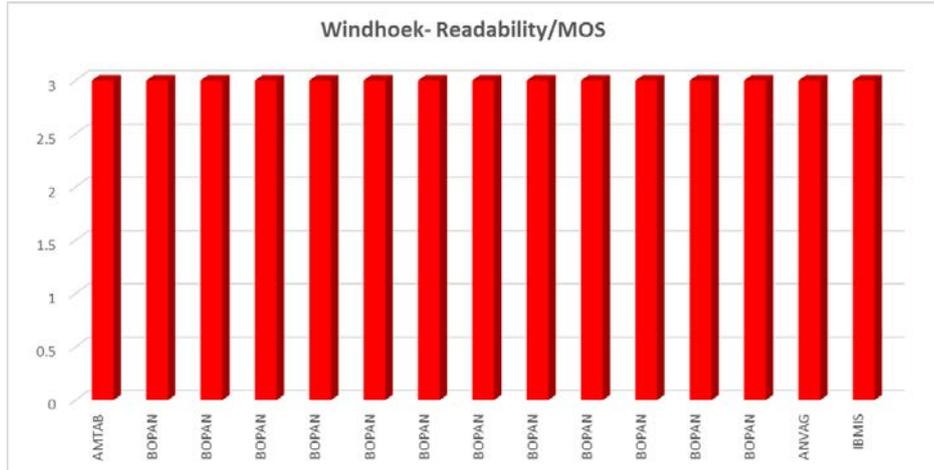
Success rate: VHF 71% and HF 70%.

Calls at EKBEL, EPSIX, AXINA, GILID, UTALI and ALRAN were poor and unreadable.

CPDLC

A total of 39 log-on attempts were made. Out of these, 70% had successful log-on and 4 CPDLC transfers to neighboring Centres were carried out using voice communications.

Windhoek



VHF/HF

A total of 20 call attempts were made on VHF.

Success rate: VHF 100%.

VHF calls at AMTAB, BOPAN, ANVAG and IBMIS were poor and unreadable.

CPDLC

CPDLC is not implemented in Windhoek FIR.