

**3rd and final frequency coordination meeting
on the GE84 Plan Optimization for Africa**

**3^{ème} et dernière réunion de coordination
des fréquences sur l'optimisation
du Plan GE84 pour l'Afrique**

24 - 28 January 2022



AFRICAN TELECOMMUNICATIONS UNION
UNION AFRICAINE DES TÉLÉCOMMUNICATIONS



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GE84 optimization in eTools

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BR/TSD/BCD

<https://www.itu.int/ITU-R/eTerrestrial/eBroadcasting>





GE84 tools



eTools: Calculations on-demand

[eTools Disclaimer](#) [eTools Documentations](#)

The processing system is currently **ONLINE** (28 processes available)

Please select the calculation type

GE84

GE84 Optimization

- GE84 Compatibility Analyses
- GE84 Optimization**
- All

Notice types – CAUTION: fragment=GE84!

- Notices accepted: T01 and TB5

The notices submitted to the iterations are simulations

T01

Date of notification: 12/10/2010 ID1/Unique identification code given by the Administration to the assignment: _____

Fragment: Article 11 GE84 ST61

Notification intended for: Addition Modification

12A/ Operating agency: _____ 2C/ Date of bringing into use: _____

12B/ Address code: _____ 10B/ Regular hours of operation (UTC): From: _____ To: _____

Assignment characteristics: Antenna characteristics

Station information

4A/ Antenna site name: AAZANEN 4C/ Longitude: 3° 7' 3" W 9EA/ Altitude of site above sea level: 184 m 3A1/ Call sign: _____

4B/ Geographic area: MRC Latitude: 35° 15' 7" N 3A2/ Station identification: _____

Emission characteristics

1A/ Assigned frequency: 87.7 MHz 7D/ Transmission system: 4 8BH/ Horizontal e.r.p.: _____ dBW

7AB/ Bandwidth: 300.000 kHz 9D/ Polarization: V 8BV/ Vertical e.r.p.: 35.000 dBW

Antenna characteristics

9/ Antenna directivity: D 9EB/ Maximum Effective Antenna Height: 209 m 9E/ Height of Antenna Above Ground Level: 25 m

Coordination successfully completed with the following administrations

Available administrations	Selected administrations
AFG	ALG
AFS	E
AGL	
ALB	
AND	

13C/ Notified remarks: _____

Optimization Tool

- This tool has been primarily developed to achieve an efficient use of the 87.5-108 MHz (FM) band for analogue sound broadcasting and to allocate new frequencies to FM broadcasting to meet the increasing need for additional frequencies in African countries.
- This tool can also be used by all the administrations party to the GE84 Agreement.

Optimization Tool

Goal

- to allocate new frequencies to FM broadcasting to meet the growing need for additional frequencies

Results

- Nuisance Field strength (NFS) generated and received by a proposed requirement in view to identify additional frequencies

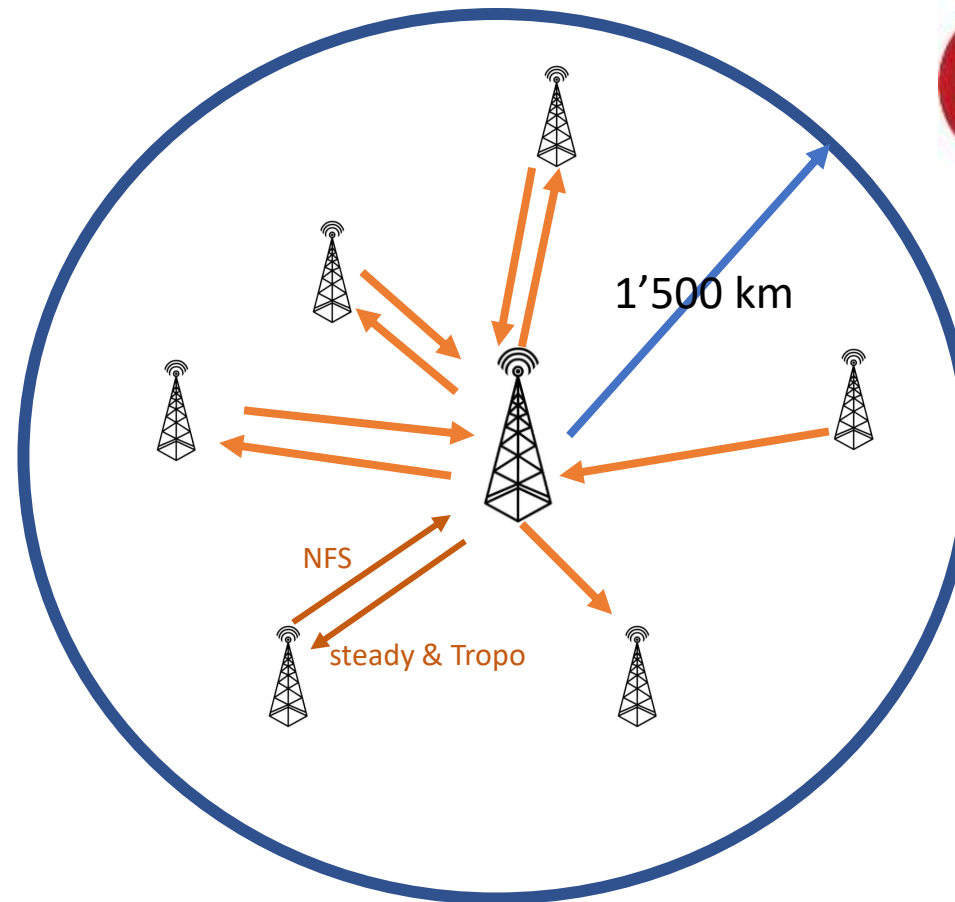
Analysis of the results

- Search for an assignable frequency based on predefined criteria

Optimization Tool



GE84
Plan
optimization

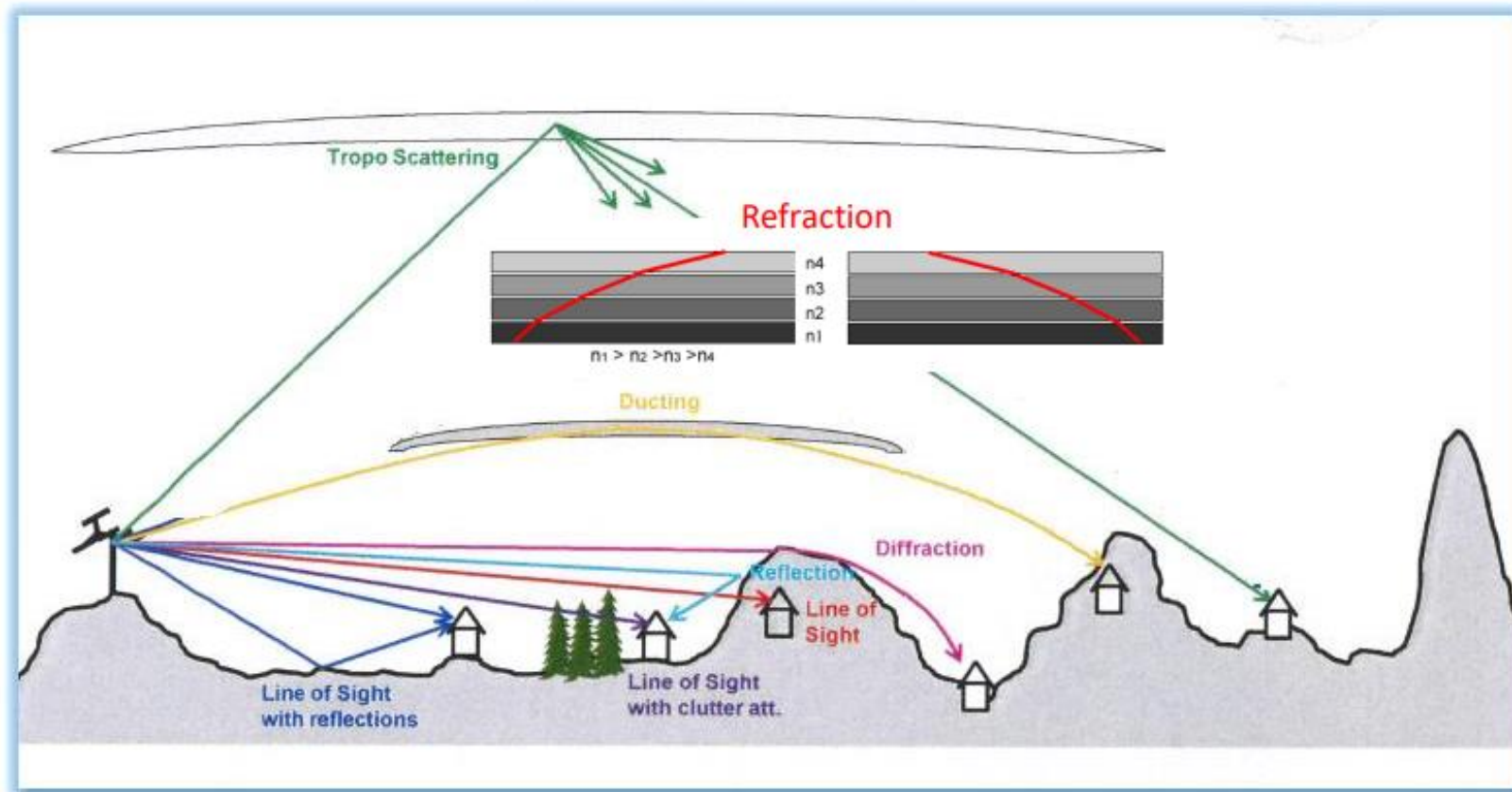


Based on the coordinates of a station, the tool assesses all identified interference sources within a radius of **1'500 km** for a **given frequency and adjacent frequencies** up to ± 400 kHz.



Rec. ITU-R P. 1812

Propagation mechanisms in the VHF/UHF band



Adapted from LS Telecom Propagation training material



Optimization Tool

- **Compatibility calculations (NFS)**
 - **between the requirements submitted** to the calculations
 - **between the requirements and the Plan Entries (TIP & RECORDED)**

Note: Only NFS values ≥ 30 dB(μ V/m) are displayed
- Introduction of the notion of **requirements with a flexible frequency.**
- For flexible frequency requirements, **the entire FM band (87.6 to 107.9 MHz) is analysed in steps of 100 kHz.**
- **IMPORTANT: Flexible frequency requirements have to be removed for the submissions to the iterations (no longer accepted **since iteration 9, Thursday, 13 May 2021.**)**

BUT you can still use FLEX in your account for your local runs. Very useful to replace a non-assignable frequency!



Optimization tool

*Flexible
Frequency
Requirement*

T01

Date of notification: [dropdown] ID1/ Unique identification code given by the Administration to the assignment: [text box]

Fragment: Article 11 GE84 ST61
Notification intended for: Addition Modification [...]

12A/ Operating agency: [dropdown] 2C/ Date of bringing into use: [dropdown]

12B/ Address code: [dropdown] 10B/ Regular hours of operation (UTC): From [dropdown] To [dropdown]

Assignment characteristics | **Antenna characteristics**

Station information
4A/ Antenna site name: KIBWEZI
4B/ Geographic area: KEN
4C/ Longitude: 37° 55' 0" E
Latitude: 2° 22' 0" S
9EA/ Altitude of site above sea level: 1087 m
3A1/ Call sign: [text box]
3A2/ Station identification: FLEX

Emission characteristics
1A/ Assigned frequency: 87.7 MHz
7AB/ Bandwidth: 300.000 kHz
7D/ Transmission system: 4
9D/ Polarization: H
8BH/ Horizontal e.r.p.: 47.800 dBW
8BV/ Vertical e.r.p.: [text box] dBW

Antenna characteristics
9/ Antenna directivity: D
9EB/ Maximum Effective Antenna Height: 342 m
9E/ Height of Antenna Above Ground Level: 100 m

Coordination successfully completed with the following administrations

Available administrations	Selected administrations
AFG	
AFS	
AGL	
ALB	
ALG	

13C/ Notified remarks: [text area]



Optimization tool

Calculation
criteria

Configuration Information (only results with Nuisance Field Strength (NFS) ≥ 30 dB ($\mu\text{V}/\text{m}$) will be displayed):

Consider Tip TV also Polarization Discrimination (dB) Use P.1812 propagation model



Criteria for
the definition
of assignable
frequencies

Ignore self interference Ignore interference received Acceptable NFS (dB ($\mu\text{V}/\text{m}$))

Select the
Adm to be
analyzed

Job Output

Input notice file validated by the OnlineValidation process on 1/17/2022 10:10:51 AM

Ignore self interference Ignore interference received Acceptable NFS (dB ($\mu\text{V}/\text{m}$))

Select Analysis option

Evaluate Statistics

Select Administration

LBR

Evaluate Statistics

Online demo

<https://www.itu.int/ITU-R/eTerrestrial/eBroadcasting>



ONLY applied to Reqt's with a FIXED frequency!!!!

The coordination info of the Plan Entries is not taken into account

Optimization Tool

Introduction of Coordination

T01

Date of notification: [dropdown] ID1/ Unique identification code given by the Administration to the assignment: [text: Example]

Fragment: Article 11 GE84 ST61
Notification intended for: Addition Modification [...]

12A/ Operating agency: [dropdown] 2C/ Date of bringing into use: [dropdown]

12B/ Address code: [dropdown] 10B/ Regular hours of operation (UTC): From [dropdown] To [dropdown]

Assignment characteristics | Antenna characteristics

Station information

4A/ Antenna site name: [text: AUGRABIES] 4B/ Geographic area: [dropdown: AFS] 4C/ Longitude: [20° 24' 0" E] Latitude: [28° 34' 0" S] 9EA/ Altitude of site above sea level: [text: 755] m 3A1/ Call sign: [text:] 3A2/ Station identification: [text: FLEX]

Emission characteristics

1A/ Assigned frequency: [text: 104] MHz 7AB/ Bandwidth: [text: 300.000] kHz 7D/ Transmission system: [dropdown: 4] 9D/ Polarization: [dropdown: V] 8BH/ Horizontal e.r.p.: [text:] dBW 8BV/ Vertical e.r.p.: [text: 37] dBW

Antenna characteristics

9/ Antenna directivity: [dropdown: ND] 9EB/ Maximum Effective Antenna Height: [text: 388] m 9E/ Height of Antenna Above Ground Level: [text: 220] m

Coordination successfully completed with the following administrations

Available administrations	Selected administrations
AFG	NMB
AGL	
ALB	
ALG	
AND	

12C/ Notified remarks: [text:]

Optimization Tool

Introduction of Coordination

AFS Augrabies – Agreement from NMB



Ignore self interference
 Ignore interference received
 Acceptable NFS (dB (μV/m))

Showing results for submitted requirements from AFS

Select requirement:

104 MHz-AUGRABIES (020°24'00"E-28°34'00"S) System 4 Polarization V - Id: 1

GE84 Optimization Description

Summary [104 MHz-AUGRABIES (020°24'00"E-28°34'00"S) System 4 Polarization V - Id: 1]

Details of the requirement under consideration

Show top 5 interferers in the summary
 Show top 5 affected in the summary
 Show assignable frequencies on top

Excel

Frequency (MHz)	Max NFS Received (dB(μV/m))	Max NFS Generated (dB(μV/m))	Top five affected																
			Assign ID	Adm.	Intent	Class	Freq.	Pol.	Site Name	Dist.	Cold Sea	Warm Sea	Sup. Refr.	ERP	Azim.	Prot. Ratio	NFS	Coord.	
104	49.11	58.15	2	NMB	ADD	BC	104.2	V	ARIAMSVLEI	73	0	0	0	37	310.9	7	58.15	Yes	
			084002558	NMB	RECORDED	BC	103.7	H	ARIAMSVLEI	73	0	0	0	37	310.9	-7	34.15	Yes	



Optimization Tool

Introduction of Coordination

AFS AUGRABIES (Assign ID 1) – Agreement from NMB –
Impact on interference received by NMB ARIAMSVLEI

Showing results for submitted requirements from NMB

Select requirement:
104.2 MHz-ARIAMSVLEI (019°50'00"E-28°08'00"S) System 4 Polarization V - Id: 2

GE84 Optimization Description

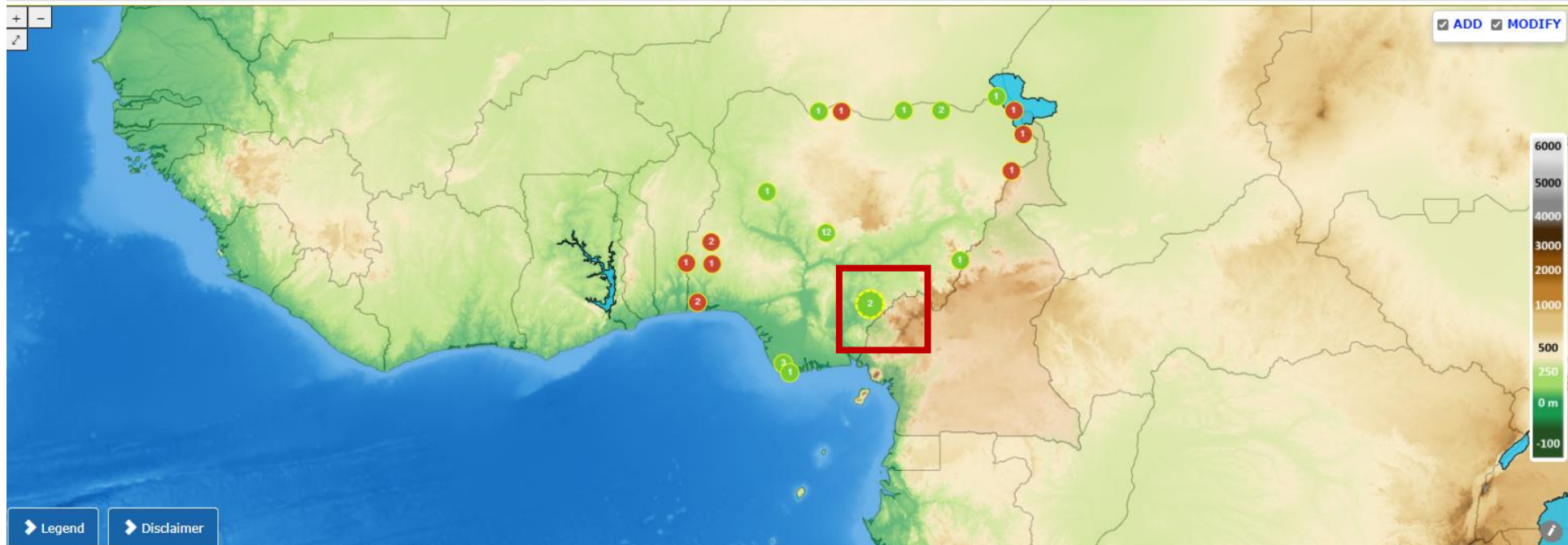
Summary [104.2 MHz-ARIAMSVLEI (019°50'00"E-28°08'00"S) System 4 Polarization V - Id: 2]

Details of the requirement under consideration

Show top 5 interferers in the summary Show top 5 affected in the summary Show assignable frequencies on top

Frequency (MHz)	Max NFS Received (dB(μV/m))	Max NFS Generated (dB(μV/m))	Top five interferers													Coord.		
			Assign ID	Adm.	Intent	Class	Freq.	Pol.	Site Name	Dist.	Cold Sea	Warm Sea	Sup. Refr.	ERP	Azim.		Prot. Ratio	NFS
104.2	58.15	49.11	1	AFS	ADD	BC	104	V	AUGRABIES	73	0	0	0	37	310.9	7	58.15	Yes
			084002199	NMB	RECORDED	BC	104.3	H	KEETMANSHOOP	241	0	0	0	47	136.1	25	52.23	---
			084000416	AFS	RECORDED	BC	104.5	H	AUGRABIES	73	0	0	0	47	310.9	-7	44.69	---
			084000284	AFS	RECORDED	BC	104.3	H	GARIES	296	0	0	0	37	35.4	25	38.92	---

P1812 calculations – NIG Obudu FLEX



Configuration Information (only results with Nuisance Field Strength (NFS) ≥ 30 dB ($\mu\text{V}/\text{m}$) will be displayed):

Consider Tip TV also Polarization Discrimination (dB) Use P.1812 propagation model

P1812 calculations – NIG Obudu FLEX – Assignable channels

Frequency (MHz)	Max NFS Received (dB(μV/m))	Max NFS Generated (dB(μV/m))	Top five interferers							Dist.	Cold Sea	Warm Sea	Sup. Refr.	ERP	Azim.	Prot. Ratio	NFS
			Assign ID	Adm.	Intent	Class	Freq.	Pol.	Site Name								
107.7	32.18	44.54	084108895	GAB	RECORDED	BC	107.7	H	LIBREVILLE	695	-	-	-	50	357.2	37	32.18
			084105553	CME	RECORDED	BC	107.9	H	MAGBA	230	-	-	-	44.8	288.6	7	31.8
107.6	34.59	50.08	084044140	NIG	RECORDED	BC	107.2	H	ABAKALI	116	-	-	-	50	71.8	-20	34.59
			127	CME	ADD	BC	107.6	H	BAFOUSSAM	191	-	-	-	20	313.8	37	31.76
103.1	43.61	53.48	084044247	NIG	RECORDED	BC	103.3	H	IBI	250	-	-	-	50	221.8	7	43.61
			084042707	CME	RECORDED	BC	103	H	NKONGSAMBA	205	-	-	-	30	335.3	33	40.19
			103	CME	ADD	BC	103.1	V	BAFUT	122	-	-	-	20	301.6	45	40.17
			084044379	NIG	RECORDED	BC	102.9	H	PT HARCOURT	311	-	-	-	50	49.6	7	39.2
			116	CME	ADD	BC	103.1	V	BALIKUMBAT	159	-	-	-	20	302	45	34.04
99.6	44.49	42.98	084042706	CME	RECORDED	BC	99.5	H	NKONGSAMBA	205	-	-	-	34	335.3	33	44.49
			084044246	NIG	RECORDED	BC	99.8	H	IBI	250	-	-	-	50	221.8	7	43.61
			084044378	NIG	RECORDED	BC	99.4	H	PT HARCOURT	311	-	-	-	50	49.6	7	39.2
96.3	44.49	48.35	084042705	CME	RECORDED	BC	96.2	H	NKONGSAMBA	205	-	-	-	34	335.3	33	44.49
			084044245	NIG	RECORDED	BC	96.5	H	IBI	250	-	-	-	50	221.8	7	43.61
			084044377	NIG	RECORDED	BC	96.1	H	PT HARCOURT	311	-	-	-	50	49.6	7	39.2
			117117474	CME	RECORDED	BC	96.3	V	DSCHANG	169	-	-	-	15	322.5	45	31.27
93.1	47.64	51.48	084042704	CME	RECORDED	BC	93	H	NKONGSAMBA	205	-	-	-	37	335.3	33	47.64
			084044244	NIG	RECORDED	BC	93.3	H	IBI	250	-	-	-	50	221.8	7	43.61
			084108098	BEN	RECORDED	BC	93.1	H	GRAND POPO	813	-	-	-	50	86.5	37	39.78
			084044376	NIG	RECORDED	BC	92.9	H	PT HARCOURT	311	-	-	-	50	49.6	7	39.2
107.8	49.8	53.75	117117555	CME	RECORDED	BC	93.1	V	MAGBA	230	-	-	-	25	288.6	45	33.98
			084105553	CME	RECORDED	BC	107.9	H	MAGBA	230	-	-	-	44.8	288.6	25	49.8
90	50.79	51.16	118091334	CME	RECORDED	BC	107.8	V	BATIBO	122	-	-	-	15	318.7	45	34.91
			084042703	CME	RECORDED	BC	89.9	H	NKONGSAMBA	205	-	-	-	40	335.3	33	50.79
104.2	51.8	52.18	084044243	NIG	RECORDED	BC	90.2	H	IBI	250	-	-	-	50	221.8	7	43.61
			084044375	NIG	RECORDED	BC	89.8	H	PT HARCOURT	311	-	-	-	50	49.6	7	39.2
			084105543	CME	RECORDED	BC	90.2	H	MUNDEBA	193	-	-	-	40	9.6	7	34.18
			117117496	CME	RECORDED	BC	90.1	V	EVUMOJOK	101	-	-	-	15	11.3	33	32.77
			084044338	NIG	RECORDED	BC	104.5	H	MAKURDI	133	-	-	-	50	152.2	-7	51.8
084109201	CME	RECORDED	BC	104.2	H	MAGBA	240	-	-	-	30	289.2	37	48.47			
084109042	CME	RECORDED	BC	104.1	H	KUMBO	176	-	-	-	30	286.1	33	45.95			
084042744	CME	RECORDED	BC	104.4	H	MANFE	103	-	-	-	34	350.3	7	45.94			
084109141	CME	RECORDED	BC	104.1	H	MUNDEBA	193	-	-	-	30	9.6	25	41.58			

P1812 calculations – Radio-climatic zones

Zone type	Code	Definition
Coastal land	A1	Coastal land and shore areas, i.e. land adjacent to the sea up to an altitude of 100 m relative to mean sea or water level, but limited to a distance of 50 km from the nearest sea area. Where precise 100 m data are not available an approximate value may be used
Inland	A2	All land, other than coastal and shore areas defined as “coastal land” above
Sea	B	Seas, oceans and other large bodies of water (i.e. covering a circle of at least 100 km in diameter).

GE84 calculations – NIG Obudu FLEX – Assignable channels

Frequency (MHz)	Max NFS Received (dB(μV/m))	Max NFS Generated (dB(μV/m))	Top five interferers														
			Assign ID	Adm.	Intent	Class	Freq.	Pol.	Site Name	Dist.	Cold Sea	Warm Sea	Sup. Refr.	ERP	Azim.	Prot. Ratio	NFS
107.7	48.16	47.15	084108895	GAB	RECORDED	BC	107.7	H	LIBREVILLE	695	0	283	0	50	357.2	37	48.16
			084105553	CME	RECORDED	BC	107.9	H	MAGBA	230	0	0	0	44.8	288.6	7	43.11
			127	CME	ADD	BC	107.6	H	BAFOUSSAM	191	0	0	0	20	313.8	25	38.39
100.6	48.22	52.65	084109041	CME	RECORDED	BC	100.5	H	KUMBO	176	0	0	0	30	286.1	25	48.22
			117117492	CME	RECORDED	BC	100.6	V	EVUMOJOK	101	0	0	0	15	11.3	37	46.41
			084044337	NIG	RECORDED	BC	100.9	H	MAKURDI	133	0	0	0	50	152.2	-7	45.65
			084109026	CME	RECORDED	BC	100.5	H	FOUMBOT	207	0	0	0	30	308.2	25	43.49
			084109051	CME	RECORDED	BC	100.5	H	MANJO	214	0	0	0	30	340	25	41.32
94.4	52.14	47.47	084044341	NIG	RECORDED	BC	94.4	H	MINNA	439	0	0	0	44	138	37	52.14
			084042549	CME	RECORDED	BC	94.3	H	BAFOUSSAM	193	0	0	0	34	313.8	25	52.07
			084044197	NIG	RECORDED	BC	94.4	H	DELTA	379	0	0	0	37	60.8	37	50.56
			084044149	NIG	RECORDED	BC	94.5	H	AKURE	442	0	0	0	50	98.3	25	45.87
			084044335	NIG	RECORDED	BC	94.1	H	MAKURDI	133	0	0	0	50	152.2	-7	45.65
97.7	52.14	48	084044342	NIG	RECORDED	BC	97.7	H	MINNA	439	0	0	0	44	138	37	52.14
			084042550	CME	RECORDED	BC	97.6	H	BAFOUSSAM	193	0	0	0	34	313.8	25	52.07
			084044198	NIG	RECORDED	BC	97.7	H	DELTA	379	0	0	0	37	60.8	37	50.56
			084044150	NIG	RECORDED	BC	97.8	H	AKURE	442	0	0	0	50	98.3	25	45.87
			084044336	NIG	RECORDED	BC	97.4	H	MAKURDI	133	0	0	0	50	152.2	-7	45.65
101.2	52.14	48.4	084044343	NIG	RECORDED	BC	101.2	H	MINNA	439	0	0	0	44	138	37	52.14
			084044199	NIG	RECORDED	BC	101.2	H	DELTA	379	0	0	0	37	60.8	37	50.56
			084042551	CME	RECORDED	BC	101.1	H	BAFOUSSAM	193	0	0	0	30	313.8	25	48.07
			084044151	NIG	RECORDED	BC	101.3	H	AKURE	442	0	0	0	50	98.3	25	45.87
			084044337	NIG	RECORDED	BC	100.9	H	MAKURDI	133	0	0	0	50	152.2	-7	45.65
104.8	52.14	50.7	084044344	NIG	RECORDED	BC	104.8	H	MINNA	439	0	0	0	44	138	37	52.14
			084044200	NIG	RECORDED	BC	104.8	H	DELTA	379	0	0	0	37	60.8	37	50.56
			084108905	GAB	RECORDED	BC	104.8	H	PORT-GENTIL	811	0	531	0	50	6.5	37	50.31
			084042552	CME	RECORDED	BC	104.7	H	BAFOUSSAM	193	0	0	0	30	313.8	25	48.07
			084044152	NIG	RECORDED	BC	104.9	H	AKURE	442	0	0	0	50	98.3	25	45.87

GE84/P1812
calculations –
NIG Obudu FLEX
– Assignable
channels

GE84 →

Frequency (MHz)	Max NFS Received (dB(μV/m))	Max NFS Generated (dB(μV/m))
<u>107.7</u>	48.16	47.15
<u>100.6</u>	48.22	52.65
<u>94.4</u>	52.14	47.47
<u>97.7</u>	52.14	48
<u>101.2</u>	52.14	48.4
<u>104.8</u>	52.14	50.7

← P1812

Frequency (MHz)	Max NFS Received (dB(μV/m))	Max NFS Generated (dB(μV/m))
<u>107.7</u>	32.18	44.54
<u>107.6</u>	34.59	50.08
<u>103.1</u>	43.61	53.48
<u>99.6</u>	44.49	42.98
<u>96.3</u>	44.49	48.35
<u>93.1</u>	47.64	51.48
<u>107.8</u>	49.8	53.75
<u>90</u>	50.79	51.16
<u>104.2</u>	51.8	52.18

GE84/P1812 calculations

NIG Obudu FLEX Calculation time comparison

119064	NIG-P1812-FLEX	Success	GE84_OPT	188
119055	NIG-GE84-FLEX	Success	GE84_OPT	9

P1812 calculations – How to use the tool to identify an additional frequency DURING the coordination process

Submit 1 FLEX requirement in your file and select **P1812 calculations with neighbours**

Identify an assignable frequency

Fix the frequency

Run a job the requirement with the **FIXED** frequency using GE84 curves (with neighbours)

If the GE84 calculations identify levels of interf. > 54 dB(μ V/m):

- coordinate with the neighbours showing the results provided by P1812 calculations to prove that the level of interf. is acceptable when terrain info. is considered

Thank you for your attention
Questions ?



GHA– Agreements from TGO & CTI – Impact on interference generated by ACCRA 106.3 MHz. Should this be reviewed?

Receiver Info (click to hide)

Adm	Name	BR Assigned Id
TGO	LOME HEDRZNAWOE	18800
Freq (MHz)	long[DDMMSS]	lat[DDMMSS]
106.3	0011453	061147
Pol.	hgt agl(m)	Transm. System
Vertical	10	4

Propagation Model (click to show)

FS Labels (click to show)

Results (click to hide)

Tropo. Calculation		Steady Calculation	
Job Id (1% of Time)	Job Id (50% of Time)	Pol Dis.(dB)	F. Sep[kHz]
133432	133433	0	0
PR tropospheric (dB)	PR steady (dB)	Dist(km)	Azimuth
37	45	159.7	78.4
FS 1% of Time (dB(μV/m))	FS 50% of Time(dB(μV/m))	NFS (dB(μV/m))	
31.9	17.93	68.90 (Tropo)	

Select requirement:

106.3 MHz-ACCRA (000°09'57"W-05°54'27"N) System 4 Polarization V - Id: 1167

GE84 Optimization Description

Summary [106.3 MHz-ACCRA (000°09'57"W-05°54'27"N) System 4 Polarization V - Id: 1167]

Details of the requirement under consideration

Show top 5 interferers in the summary
 Show top 5 affected in the summary
 Show assignable frequencies on top

Excel

Frequency (MHz)	Max NFS Received (dB(μV/m))	Max NFS Generated (dB(μV/m))	Top five affected														Ratio NFS	Coord.
			Assign ID	Adm.	Intent	Class	Freq.	Pol.	Site Name	Dist.	Cold Sea	Warm Sea	Sup. Refr.	ERP	Azim.	Pro		
106.3	68.78	74.49	2423	TGO	ADD	BC	106.3	V	LOME HEDRZNAWOE	160	0	0	0	44.4	78.3	37	74.49	Yes
			1476	GHA	ADD	BC	106.3	V	TAKORADI	207	0	54	0	44.4	238.5	37	74.19	---
			111055755	GHA	RECORDED	BC	106.3	V	ATEBUBU	224	0	0	0	44.4	336.2	37	69.57	---
			1241	GHA	ADD	BC	106.3	V	Atebubu	263	0	0	0	44.4	348.4	37	66.39	---
			780	CTI	ADD	BC	106.3	V	Noe E	299	0	0	0	44.4	256.9	37	63.32	Yes



GHA– Agreement from TGO & CTI – Impact on interference generated by ACCRA 106.3 MHz. Should this be reviewed?

Receiver Info (click to hide)

Adm	Name	BR Assigned Id
BEN	ABOMEY CALAVI	3031
Freq (MHz)	long[DDMMSS]	lat[DDMMSS]
106.3	0022500	063000
Pol.	hgt agl(m)	Transm. System
Vertical	10	4

Propagation Model (click to show)

FS Labels (click to show)

Results (click to hide)

Tropo. Calculation		Steady Calculation	
Job Id (1% of Time)	Job Id (50% of Time)	Pol Dis (dB)	F. Sep[kHz]
133423	133424	0	0
PR tropospheric (dB)	PR steady (dB)	Dist(km)	Azimuth
37	45	293.2	77
FS 1% of Time (dB(μV/m))	FS 50% of Time(dB(μV/m))	NFS (dB(μV/m))	
-5.08	-85.5	31.92 (Tropo)	

Select requirement (360):

ACCRA | 106.3 MHz (000°09'57"W-05°54'27"N) System 4 POL V - Id: 8374 (ADD)

GE84 Optimization Description

Summary [106.3 MHz-ACCRA (000°09'57"W-05°54'27"N) System 4 Polarization V - Id: 8374]

Details of the requirement under consideration

Show top 5 interferers in the summary
 Show top 5 affected in the summary
 Show assignable frequencies on top

Excel

Frequency (MHz)	Max NFS Received (dB(μV/m))	Max NFS Generate (dB(μV/m))	Top five affected													Prot. Ratio	NFS	Coord
			Assign ID	Adm.	Intent	Class	Freq.	Pol.	Site Name	Dist.	Cold Sea	Warm Sea	Sup. Refr.	ERP	Azim.			
106.3	68.78	74.49	18800	TGO	ADD	BC	106.3	V	LOME HEDRZNAWOE	160	0	0	0	44.4	78.3	37	74.49	Yes
			8683	GHA	ADD	BC	106.3	V	TAKORADI	207	0	54	0	44.4	238.5	37	74.19	---
			111055755	GHA	RECORDED	BC	106.3	V	ATEBUBU	224	0	0	0	44.4	336.2	37	69.57	---
			8448	GHA	ADD	BC	106.3	V	Atebubu	263	0	0	0	44.4	348.4	37	66.39	---
			3031	BEN	MODIFY	BC	106.3	V	ABOMEY CALAVI	293	0	0	0	44.4	76.9	37	62.08	Yes



Optimization Tool

*Review
agreements
given at an early
stage of the
process*

GHA– Agreement from TGO & CTI – Impact on interference generated by ACCRA 106.3 MHz
Ignore self interference

106.3 MHz-ACCRA (000°09'57"W-05°54'27"N) System 4 Polarization V - Id: 1167

GE84 Optimization Description

Summary [106.3 MHz-ACCRA (000°09'57"W-05°54'27"N) System 4 Polarization V - Id: 1167]

Details of the requirement under consideration

Show top 5 interferers in the summary Show top 5 affected in the summary Show assignable frequencies on top

Excel

Frequency (MHz)	Max NFS Received (dB(μV/m))	Max NFS Generated (dB(μV/m))	Top five affected															
			Assign ID	Adm.	Intent	Class	Freq.	Pol.	Site Name	Dist.	Cold Sea	Warm Sea	Sup. Rel	ERP	Alt.	Prot	Ratio NFS	Coord.
106.3	68.78	74.49	2423	TGO	ADD	BC	106.3	V	LOME HEDRZNAWOE	160	0	0	0	44.4	75.3	37	74.49	Yes
			1476	GHA	ADD	BC	106.3	V	TAKORADI	207	0	54	0	44.4	238.5	37	74.19	---
			111055755	GHA	RECORDED	BC	106.3	V	ATEBUBU	224	0	0	0	44.4	336.2	37	69.57	---
			1241	GHA	ADD	BC	106.3	V	Atebubu	263	0	0	0	44.4	338.4	37	66.39	---
			780	CTI	ADD	BC	106.3	V	Noe E	299	0	0	0	44.4	256.9	37	63.32	Yes



GHA– BEN ABOMEY-NIG should I coordinate?

NFS Calculation with P.1812v4 (Beta)

Transmitter Info (click to show)

Receiver Info (click to show)

Propagation Model (click to show)

FS Labels (click to show)

Results (click to hide)

Tropo. Calculation

Steady Calculation

Job Id (1% of Time)

Job Id (50% of Time)

Pol Dis.(dB)

F. Sep[kHz]

132969

132970

0

0

PR tropospheric (dB)

PR steady (dB)

Dist(km)

Azimuth

37

45

390.9

221.6

FS 1% of Time (dB(μV/m))

FS 50% of Time(dB(μV/m))

NFS (dB(μV/m))

29.59

14.9

66.59 (Tropo)

Requirement (157):

ABOMEY | 90.9 MHz (001°59'00"E-07°11'00"N) System 4 POL H - Id: 3022 (MODIFY)

Optimization Description

Summary [90.9 MHz-ABOMEY (001°59'00"E-07°11'00"N) System 4 Polarization H - Id: 3022]

Details of the requirement under consideration

Show top 5 interferers in the summary Show top 5 affected in the summary Show assignable frequencies on top

Excel

Frequency (MHz)	Max NFS Received (dB(μV/m))	Max NFS Generated (dB(μV/m))	Top five interferers																
			Assign ID	Adm.	Intent	Class	Freq.	Pol.	Site Name	Dist.	Cold Sea	Warm Sea	Sup. Refr.	ERP	Azim.	Dist. Ratio	NFS	Coord.	
90.9	62.35	45.04	084044184	NIG	RECORDED	BC	90.9	H	BUSSA	392	0	0	0	50	221.4	3	62.35	---	
			084044238	NIG	RECORDED	BC	91	H	IBADAN	216	0	0	0	45	263.7	2	60.58	---	
			3071	BEN	MODIFY	BC	91.3	V	BOHICON	11	0	0	0	35	279.5	10	54.61	---	
			084044268	NIG	RECORDED	BC	90.7	H	ISEYIN	190	0	0	0	50	241.6	7	52.34	---	
			110044207	BEN	RECORDED	BC	90.8	V	TCHAUROU	192	0	0	0	38	200.7	2	50.09	---	





Case of self interference. Is this requirement appropriate?

Optimization Tool

self interference

Select requirement (718):
 ABOBO | 92 MHz (004°01'21"W-05°25'02"N) System 4 POL V - Id: 6938 (ADD)

GE84 Optimization Description
 Summary [92 MHz-Abobo (004°01'21"W-05°25'02"N) System 4 Polarization V - Id: 6938]

▼ Details of the requirement under consideration

Show top 5 interferers in the summary Show top 5 affected in the summary Show assignable frequencies on top

Excel

Frequency (MHz)	Max NFS Received (dB(μV/m))	Max NFS Generate (dB(μV/m))	Top five affected																
			Assign ID	Adm.	Intent	Class	Freq.	Pol.	Site Name	Dist.	Col	Sea	Warm Sea	Sup. Refr.	ERP	Azim.	Prot. Ratio	NFS	Coord.
92	152.65	134.35	084025768	CTI	RECORDED	BC	92	H	ABOBO	2	0	0	0	0	37	19.8	36	134.35	-
			7113	CTI	ADD	BC	92.2	V	Attecoube	8	0	0	0	0	37	189.9	7	95.72	-
			6912	CTI	ADD	BC	92	V	Zaranou F	134	0	0	0	0	37	32.7	37	72.72	-
			121000076	CTI	ADD	BC	91.7	V	MARCORY	13	0	0	0	0	37	161.3	-7	71.34	-
			8447	GHA	ADD	BC	92.1	V	NKRANKWANTA	208	0	0	0	0	37	31.2	25	52.35	-



Optimization Tool

self interference

Case of self interference: Find another more appropriate channel?

Select requirement (718):
ABENGOUROU | 87.9 MHz (003°29'08"W-06°43'49"N) System 4 POL V - Id: 7139 (ADD)

GE84 Optimization Description

Summary [87.9 MHz-Abengourou (003°29'08"W-06°43'49"N) System 4 Polarization V - Id: 7139]

Details of the requirement under consideration

Show top 5 interferers in the summary Show top 5 affected in the summary Show assignable frequencies on top

Excel

Frequency (MHz)	Max NFS Received (dB(μV/m))	Max NFS Generate (dB(μV/m))	Top five interferers																
			Assign ID	Adm.	Intent	Class	Freq.	Pol.	Site Name	Dist.	Cold Sea	Warm Sea	Sup. Refr.	ERP	Azim.	Prot.	Ratio	NFS	Coord.
87.9	88.12	73.27	6879	CTI	ADD	BC	87.9	V	Koun Fao	93	0	0	0	37	194.1	45	88.12	-	
			8700	GHA	ADD	BC	87.9	V	KUMASI	206	0	0	0	38.1	270.9	37	65.62	Y	
			121000089	CTI	ADD	BC	87.9	V	Sinfra	269	0	0	0	37	87.5	37	59.15	-	
			7093	CTI	ADD	BC	88	V	Abobo	158	0	0	0	37	22.1	25	57.69	-	
			111059828	GHA	RECORDED	BC	87.9	V	AJANGOTE	375	0	0	0	41	286.8	37	54.42	-	

Abengourou FLEX - Results



GE84
Plan
optimization

Affected

102.4	58.34	58.82	631	CTI	ADD	BC	102.4	V	Tiebissou B	196	0	0	0	30	283.7	37	58.82
			121000586	CTI	ADD	BC	102.3	V	ABOISSO	146	0	0	0	30	167.3	25	51.98
			791	GHA	ADD	BC	102.3	V	SUNYANI	145	0	0	0	30	63.2	25	51.14
			482	CTI	ADD	BC	102.5	V	Yopougon	167	0	0	0	30	202.2	25	49.53
			581	CTI	ADD	BC	102.3	V	Adjame mairie	167	0	0	0	30	200.4	25	49.48

Interferers

102.4	58.34	58.82	631	CTI	ADD	BC	102.4	V	Tiebissou B	196	0	0	0	30	103.5	37	58.34
			111055745	GHA	RECORDED	BC	102.5	V	KUMASI	208	0	0	0	41	271.9	25	56.51
			121000109	CTI	ADD	BC	102.2	V	Daoukro	62	0	0	0	37	124.1	7	56
			121000586	CTI	ADD	BC	102.3	V	ABOISSO	146	0	0	0	37	347.3	25	55.47
			791	GHA	ADD	BC	102.3	V	SUNYANI	145	0	0	0	32.9	243.3	25	54.75

GE84 calculations – Why is it pink?

Showing results for submitted requirements from CTI

Select requirement (718):

ABOBO | 88.9 MHz (003°58'52"W-05°21'17"N) System 4 POL V - Id: 7299 (ADD)

GE84 Optimization Description

Summary [88.9 MHz-Abobo (003°58'52"W-05°21'17"N) System 4 Polarization V - Id: 7299]

Details of the requirement under consideration

Show top 5 interferers in the summary
 Show top 5 affected in the summary
 Show assignable frequencies on top

Excel

Frequency (MHz)	Max NFS Received (dB(μV/m))	Max NFS Generate (dB(μV/m))	Top five interferers															
			Assign ID	Adm.	Intent	Class	Freq.	Pol.	Site Name	Dist.	Cold Sea	Warm Sea	Sup. Refr.	ERP	Azim.	Prot. Ratio	NFS	Coord.
88.9	136.67	109.08	084025722	CTI	RECORDED	BC	88.9	H	ABOBO	10	0	0	0	46.3	155.8	45	136.67	---
			7116	CTI	ADD	BC	88.6	V	Cocody	1	0	0	0	33	138	-7	100.51	---
			6678	CTI	ADD	BC	88.9	V	Divo B	162	0	0	0	30	109	37	62.72	---
			8662	GHA	ADD	BC	88.9	V	AGONA AHANTA	229	0	7	0	32.6	283.2	37	56.34	Yes
			8635	GHA	ADD	BC	88.9	V	TARKWA	220	0	0	0	28.9	271.7	37	54.72	Yes