



30<sup>TH</sup> WORLD RADIOCOMMUNICATION SEMINAR

24 – 28 October 2022

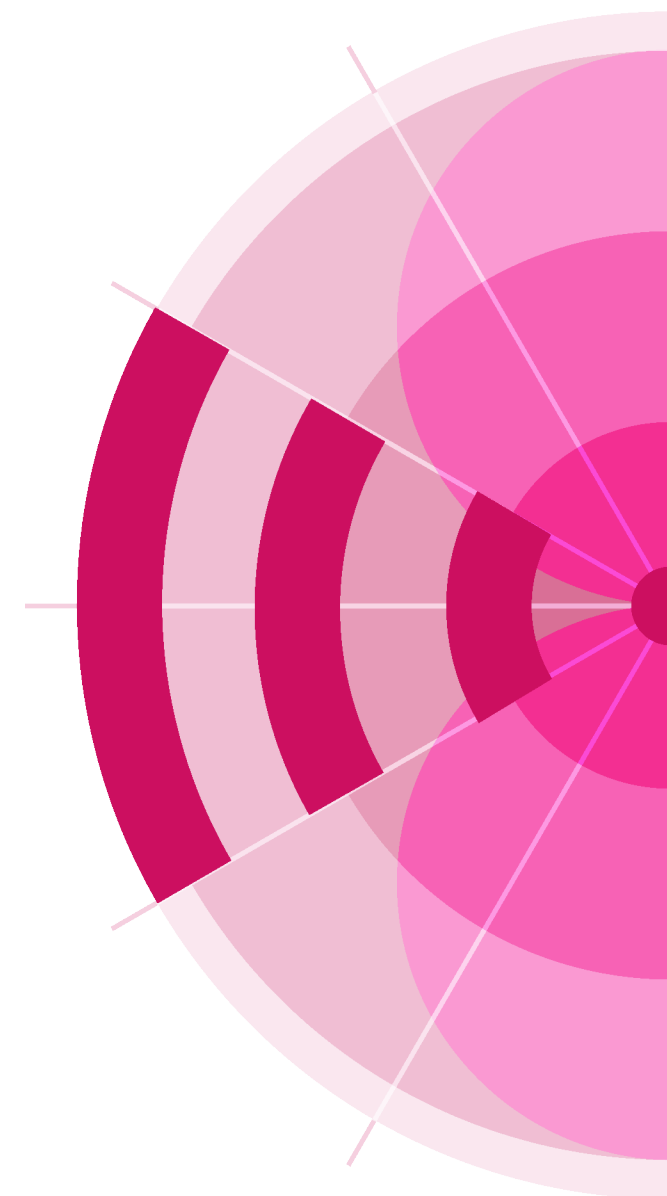
Geneva, Switzerland

# Procedures of GE84 Agreement

**By Bangaly Fodé TRAORE**  
**Broadcasting Services Division**  
**ITU/BR**

[www.itu.int/go/wrs-22](http://www.itu.int/go/wrs-22)

#ITUWRS



# The Geneva 84 Agreement

relating to the Use of the Band 87.5 - 108 MHz  
for FM Sound Broadcasting  
(Region 1 and Part of Region 3)

- 204 channels;
- 100kHz channel spacing



# GE84 in summary

- **Article 13:**
  - Entry into force on 1 July 1987, at 0001 hours UTC.
  - established for a period of 20 years from the date of entry into force of the Agreement.
  - This Agreement shall remain in force until it is revised by a competent administrative radio conference.
- **Number of assignments:**
  - 1987 : 51 168 recorded frequency assignments
  - Now : > 90 150 recorded assignments

# *Procedure of Article 4*

- The agreement provides for a Plan modification procedure described in Article 4. The procedure allows a frequency assignment's characteristics to be modified or a new assignment to be entered.
- The procedure of Article 4 considers not only sound broadcasting stations, but also other services (BT, ILS / VOR, fixed, mobile)

## *Services likely to be affected (Coordination required)*

- ✓ Other VHF-FM sound broadcasting stations(4.2.2 a)
- ✓ ST61 television assignments in the band 87.5 – 100 MHz (4.2.2 b)
- ✓ Fixed and mobile services (4.2.2 c, d)
- ✓ Aeronautical radionavigation services above 108 MHz (4.2.2 f)

# Services likely to be affected (Coordination required)

Administration	Provision	Coordination status	Source of status	Date of status	Declared affected by
BIH	4.2.2.A	COORD REQUIRED	ITU	08/10/2020	ITU
BIH	4.2.2.F	COORD REQUIRED	ITU	08/10/2020	ITU
CZE	4.2.2.F	COORD REQUIRED	ITU	08/10/2020	ITU
D	4.2.2.F	COORD REQUIRED	ITU	08/10/2020	ITU
F	4.2.2.F	COORD REQUIRED	ITU	08/10/2020	ITU
HNG	4.2.2.A	COORD REQUIRED	ITU	08/10/2020	ITU
HNG	4.2.2.F	COORD REQUIRED	ITU	08/10/2020	ITU
HRV	4.2.2.A	COORD REQUIRED	ITU	08/10/2020	ITU
HRV	4.2.2.F	COORD REQUIRED	ITU	08/10/2020	ITU
I	4.2.2.A	COORD REQUIRED	ITU	08/10/2020	ITU
I	4.2.2.F	COORD REQUIRED	ITU	08/10/2020	ITU
LIE	4.2.2.F	COORD REQUIRED	ITU	08/10/2020	ITU
POL	4.2.2.F	COORD REQUIRED	ITU	08/10/2020	ITU
ROU	4.2.2.F	COORD REQUIRED	ITU	08/10/2020	ITU
SMR	4.2.2.A	COORD REQUIRED	ITU	08/10/2020	ITU
SMR	4.2.2.F	COORD REQUIRED	ITU	08/10/2020	ITU
SRB	4.2.2.F	COORD REQUIRED	ITU	08/10/2020	ITU
SUI	4.2.2.F	COORD REQUIRED	ITU	08/10/2020	ITU

# Services likely to be affected (Coordination required)

## 4.2 *Initiation of the modification procedure*

4.2.1 Any administration proposing to modify the characteristics of an assignment appearing in the Plan or to add a new assignment to the Plan shall obtain the agreement of any other administration whose services are likely to be affected.

4.2.2 a) The sound broadcasting stations of an administration are likely to be affected by a proposed modification to the Plan if the distance from the station under consideration to the nearest point on the boundary of the country of that administration is less than the limit indicated in Annex 4, Chapter 1.

Other VHF-FM sound broadcasting stations

4.2.2 b) The television stations of an administration in the band 87.5 - 100 MHz which are in conformity with the Stockholm Agreement (1961) are likely to be affected by a proposed modification to the Plan if the distance from the station under consideration to the nearest point on the boundary of the country of that administration is less than the limit indicated in Annex 4, Chapter 2.

ST61 television assignments in the band 87.5 – 100 MHz

4.2.2 c) The stations in the fixed and mobile services of an administration of a Contracting Member in Region 3 in the band 87.5 - 100 MHz are likely to be affected by a proposed modification to the Plan if the appropriate limits indicated in Annex 4, Chapters 4 and 5, are exceeded.

4.2.2 d) The stations in the land mobile service of an administration in Region 1 in the band 87.5 - 88 MHz, coordinated under Article 14 of the Radio Regulations, are likely to be affected by a proposed modification to the Plan if the limits indicated in Annex 4, Chapter 4, are exceeded.

Fixed and Mobile services

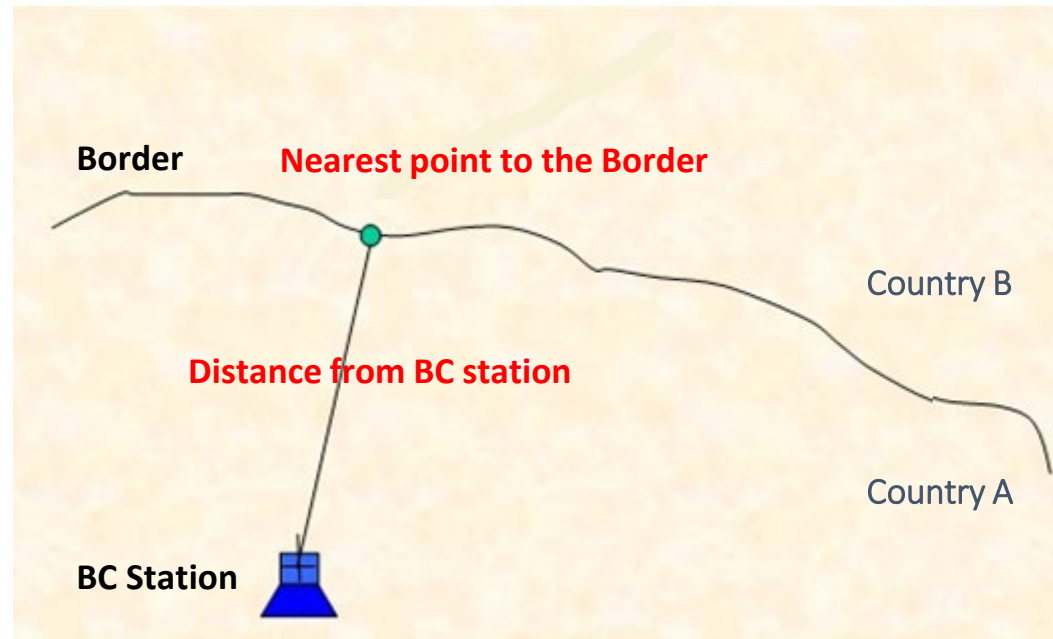
4.2.2 e) The stations of the fixed and mobile services, except the aeronautical mobile (R) service, of an administration in Region 1, operating in the band 104 - 108 MHz in conformity with the Radio Regulations on a permitted basis until 31 December 1995, are likely to be affected by a proposed modification to the Plan if the appropriate limits indicated in Annex 4, Chapters 4, 5 and 6, are exceeded.

4.2.2 f) The stations in the aeronautical radionavigation service of an administration in the band 108 - 117.975 MHz are likely to be affected by a proposed modification to the Plan if the distance from the station under consideration to the nearest point on the boundary of the country of that administration is less than the limit indicated in Annex 4, Chapter 3. In this case, the procedure to be applied is contained in Article 5.

Aeronautical radionavigation services

# Coordination with other sound/TV broadcasting services VHF-FM

- distances between the broadcasting station and the nearest point on the boundary of any other administration shall be used to identify administrations whose sound broadcasting services may be considered as affected





# *BC to BC/BT coordination distance*

- Coordination distances depend on:
  - Effective radiated power of the proposed BC station
  - Effective antenna height
  - Propagation path (land, warm/cold seas and areas of super refractivity)
- See Chapters 1 and 2 of **Annex 4** of the Agreement:
  - Tables 4.1- 4.4 : limits for sound
  - Tables 4.5 to 4.7: limits for television

# *BC to BC/BT coordination distance*

Note:

Limits for television consider

- Corrected ERPs to take account the variation in the protection ratios depending on frequency separation between FM and television frequency carriers
- Propagation path (land, warm/cold seas and areas of super refractivity)

See Chapters 2 of **Annex 4** of the Agreement:

- Tables 4.5- 4.8

TABLE 4.1

*Coordination distances,  $D_L$ , in km, for propagation paths over land*

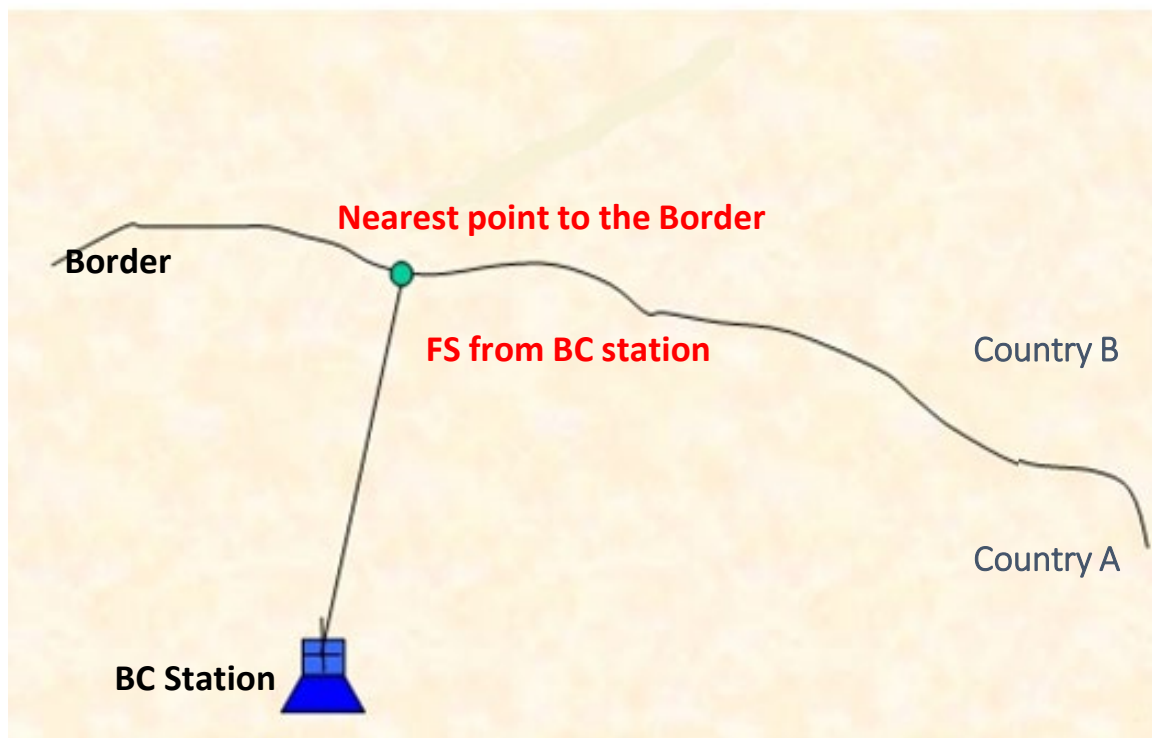
Effective radiated power		Effective antenna height (m)							
		10	37.5	75	150	300	600	1200	1800
dBW	W	Coordination distances (km)							
55	300k	520	520	530	540	560	600	630	670
50	100k	460	460	470	490	510	540	580	610
45	30k	410	410	420	430	450	480	520	560
40	10k	350	350	370	380	400	430	470	500
35	3k	300	300	310	330	340	380	420	450
30	1k	250	250	260	270	290	320	360	400
25	300	140	190	210	220	240	280	320	350
20	100	70	140	160	180	190	230	270	300
15	30	45	100	130	140	150	190	230	260
10	10	35	65	90	100	120	150	190	220
5	3	30	45	65	75	95	120	160	180
0	1	20	35	50	60	80	100	140	150

# *Agreement to proposed BC station*

- Coordination between administrations on the basis of a table of distances (Annex 4)
  
- Plan modification should normally be accepted by affected administration on the basis of the following technical criteria for the protected station:
  - a) Resulting  $E_u \leq 54$  dB( $\mu$ V/m) (sound)
  - b) Resulting  $E_u \leq 52$  dB( $\mu$ V/m) (television)
  - c) Resulting  $E_u$  increase  $\leq 0.5$  dB relative to reference  $E_u$  ( $E_{u-ref}$ ) if limit a) or b) is exceeded.

# Coordination with fixed & mobile services

*Fixed & mobile services are considered as to be affected if field strength (FS) of BC at the nearest point on the boundary of another administration exceeds established limits*



# *Coordination with Fixed and Mobile services*

- **Fixed service** : 0 dB ( $\mu\text{V}/\text{m}$ )
- **Land mobile service**: limits depend on the polarization of the BC station.

In Region 3 (87.5-100 MHz) and Region 1 (104-108 MHz), FS is:

- 18 dB( $\mu\text{V}/\text{m}$ ) for FM with horizontal polarization:
- 0 dB( $\mu\text{V}/\text{m}$ ) for FM with vertical or mixed polarization:

# Coordination with ARNS in the band 108 - 117.975 MHz

Distance to the nearest point on the border < 500 km

(Chapter 3 of Annex 4)



# Quick Modification Procedure

No agreement required if modifications involve:

- Less interference – lower ERP
- Distance to border > coordination limits
- Small change in site location
  - ✓ 15 km ERP  $\geq$  1kW
  - ✓ 5 km < 1kW

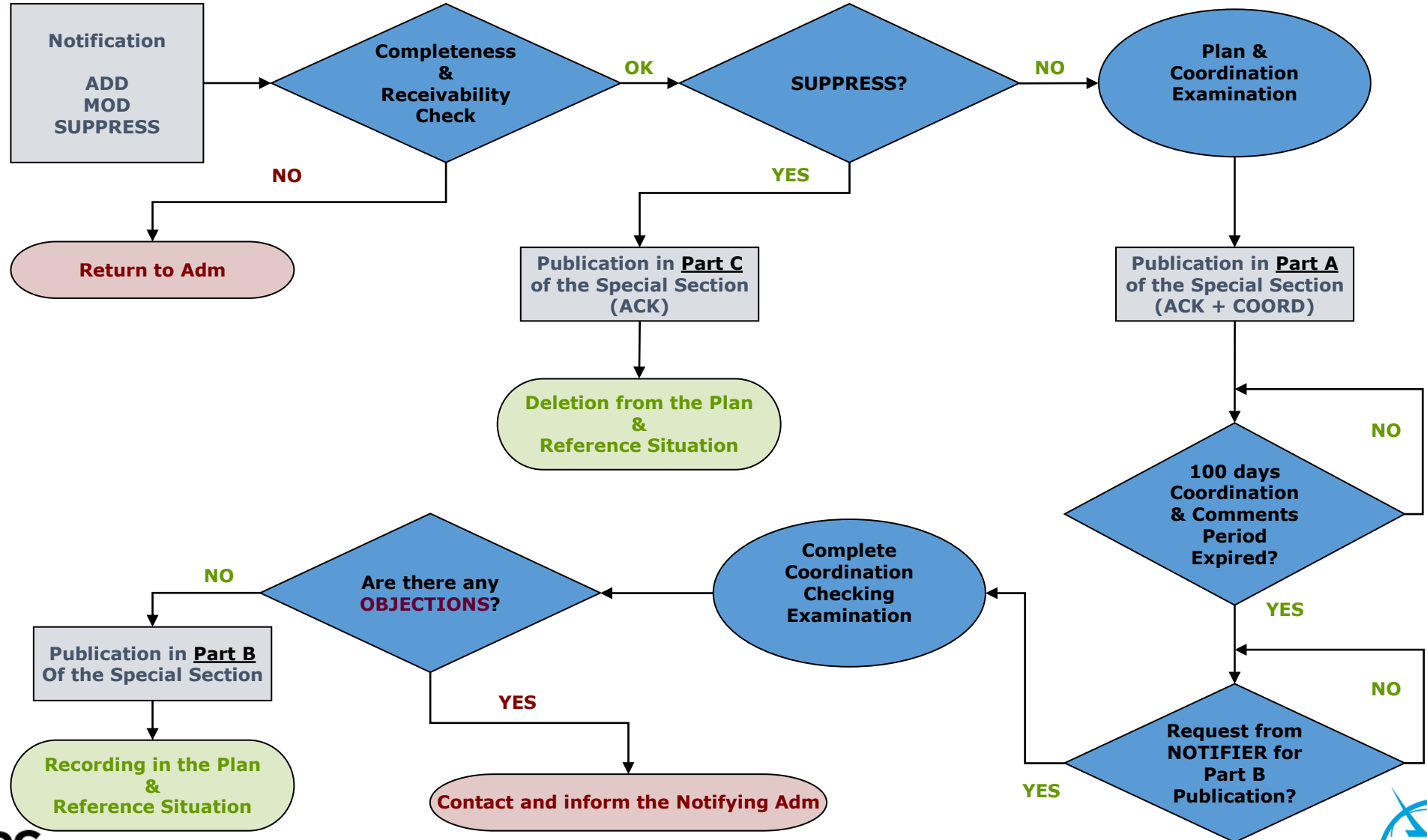
**provided that the change in topographical conditions does not increase the probability of interference caused to the stations of other countries.**



# *Plan modification Procedure*

- *Notification:*
  - T01 notice form for Addition or Modification to the Plan
  - TB5 notice for Suppression or Withdrawal
- *Coordination:*
  - No comment = AGREEMENT
- *Publication*
  - Must be requested for publication in Part B (TB3 notice)
  - Publication in Part B only if no objections
- *Important*
  - Pursuant to paragraphs 1.3 of Part A2 and 4.6.1 of Part A5 of the Rules of Procedure (RoP) the frequencies pending in coordination stage are deleted after 2 years and 100 days

# Plan modification Procedure



# Resolution 4 of the Agreement

- For Non-Contracting Members outside the planning area having aeronautical radionavigation services (108 - 117.975 MHz)
  - **Limit in Chapter 3 of Annex 4 applies.**
- Notifying administration has:
  - to consult with Adm of non-Contracting Member
  - to resolve any incompatibility, if reported by the non-Contracting Member.

# *Introduction of Digital Modulation according to the GE84 Agreement*

- **Provision 3.1 of Chapter 3 of Annex 2** provides, in addition to the 5 transmission systems defined as variants, the introduction of Digital Modulation on the conditions that this:
  - **does not cause higher interference and**
  - **does not require greater protection than the reference system mentioned in the Plan.**

# The Reference Situation

- Extract of the GE84 Agreement :
  - *“The **reference Eu** of an assignment to be protected is the FS which results from the Plan at the time this assignment was first recorded in the Plan. The reference situation is re-evaluated after each GE84 Special Section for the notices published in Part B when they are recorded into the Plan.”*
  - *If, following the introduction of new contributors in the Plan, the usable field strength of an assignment recorded in the Plan becomes higher than the Eu Ref, the Eu Ref calculated at the time an assignment is recorded in the Plan remains unchanged.*
  - *But, “if, due to deletions or modifications, the usable field strength becomes lower, then this lower value becomes the new  $E_{u-ref}$ .”*

# *The Reference Situation (cont'd)*

- The Eu calculations are performed at the transmitter site of the affected station.
- They are considering the 20 highest contributors RECORDED in the Plan.
- They are *not* considering the notices in process in the Plan and not yet RECORDED (TIP notices)
- No polarization discrimination is applied.

# The Reference Situation (cont'd)

- The details of the Eu and Eu Ref calculations (details of the top 20 contributors) are published in the BR IFIC. The updated reference situation is visible in the BR IFIC following a Part B publication.

Recorded assignment - ALG - GE84 - 084033157

Administrative Data | Emission Characteristics | Antenna Characteristics | Station and Site Information | Coordination Information | Finding Information | Publication History | Status Information | Remarks | Field Strength Details

Date of entry into the GE84 Plan: 01/02/1993  
Site name: RELIZANE - Assigned frequency: 98.7 MHz  
Transmission system: 4  
Minimum reference field strength: 54 dB(μV/m)

Recorded usable field strength: 75.89503 dB(μV/m)  
Calculated usable field strength: 75.89503 dB(μV/m)  
Recorded reference usable field strength: 73.42163 dB(μV/m)

Top contributors to the usable field strength (eu) calculation

Adm	Fragment	Assgn ID	Date of entry	Assigned Frequency	Site Name	Interference [dB(μV/m)]	
1	E	GE84	084009283	18/09/1990	98.7 MHz	TIBIDABO	64.182
2	E	GE84	084009647	07/12/1984	98.7 MHz	VELEZ MALAGA	61.412
3	E	GE84	115134559	21/03/2017	98.7 MHz	CUEVAS ALMANZORA	60.871
4	E	GE84	112107116	13/10/2020	98.7 MHz	EVISSA	59.574
5	E	GE84	084009567	07/12/1984	98.7 MHz	ALCOY	57.637
6	ALG	GE84	084033722	08/10/1991	98.6 MHz	EL BAYADH	52.846
7	MRC	GE84	084004602	07/12/1984	98.6 MHz	PALOMAS	52.736
8	E	GE84	110117858	17/04/2012	98.8 MHz	CARTAGENA	52.287
9	E	GE84	084009029	17/04/2012	98.8 MHz	PALMA DE MALLORCA	50.113
10	ALG	GE84	084033739	01/02/1993	98.8 MHz	HAFID	49.829
11	ALG	GE84	084100704	07/12/1984	98.6 MHz	TENIRA	48.855
12	ALG	GE84	084100380	07/12/1984	98.8 MHz	BORDJ EMIR ABDELKADE	47.158
13	ALG	GE84	112062388	18/08/2020	98.6 MHz	DJ ZERGA	46.418
14	E	GE84	093003225	02/12/1994	98.6 MHz	MESA ROLDAN	46.164
15	ALG	GE84	084033367	08/10/1991	99 MHz	TIARET	45.876
16	E	GE84	084009284	07/12/1984	98.6 MHz	CORDOBA	45.475
17	E	GE84	084105860	07/12/1984	98.6 MHz	ALMANSA	43.623
18	MRC	GE84	084004452	07/12/1984	98.8 MHz	CHEFCHAOUEN	43.325
19	E	GE84	084009285	18/09/1990	98.8 MHz	NAVACERRADA	43.262
20	ALG	GE84	084033341	01/02/1993	98.8 MHz	SIDI AISSA	42.971

59°46'22" E - 21°20'37" N - sea

The IDWM - Mercator map projection

*details of the contributors*

## *Notification to the Master Register (Article 7 of GE84 Agreement)*

When an administration proposes to bring into use an assignment, it shall notify its characteristics to the BR in accordance with the provisions of Article 11 of the Radio Regulations.



## *Notification to the Master Register (Article 7 of GE84 Agreement)*

When the assignment brought into use conforms to the technical characteristics described for this assignment in the Plan, it is then recorded in the Master International Frequency Register (commonly called the **MIFR**).

## ***Assistance from BR (4.3.13)***

Administration may request BR assistance in:

- ❖ Seeking agreement from another ADM
- ❖ Applying of the Article 4 procedure at any stage
- ❖ Carrying out technical studies in relation to this procedure
- ❖ GE84 compatibility analysis and GE84 Optimization are available on *eTools* at :

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

# Thank you!

ITU – Radiocommunication Bureau

Questions to [brmail@itu.int](mailto:brmail@itu.int) or [xxxx@itu.int](mailto:xxxx@itu.int)





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## SOFTWARE TOOLS :

*GE84 Compatibility Analysis*

*GE84 Optimization*

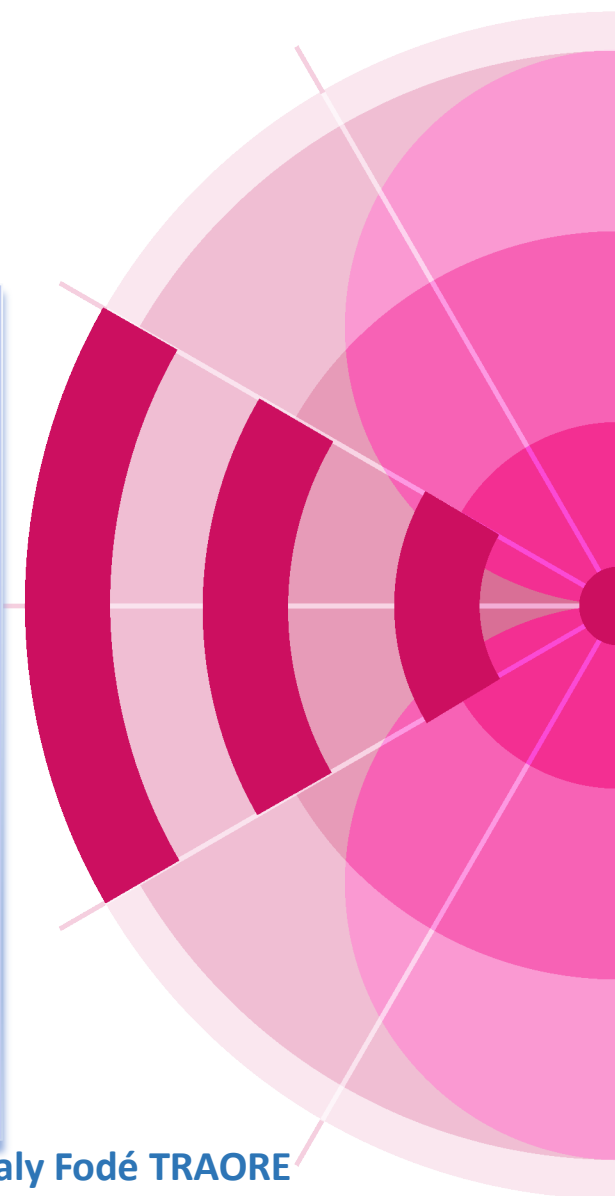
<https://www.itu.int/ITU-R/eTerrestrial/eBroadcasting>

[www.itu.int/go/wrs-22](http://www.itu.int/go/wrs-22)

#ITUWRS

by Bangaly Fodé TRAORE

BR/TSD/BCD



### Main activities

Broadcasting Services Division (BCD) examines notices and submissions for frequency assignments concerning television and sound broadcasting terrestrial services in the frequency bands LF, MF, HF, VHF and UHF.

It also provides assistance to administrations with respect to the technical, regulatory and administrative procedures applicable to the planning of terrestrial broadcasting services.

### Quick links

- [Frequency Bands allocated to Terrestrial Broadcasting Services](#)
- [The Master International Frequency Register \(MIFR\)](#)
- [LF / MF Regional Frequency Assignment Plans](#)
- [FM / TV Regional Frequency Assignment Plans](#)
- [HF Broadcasting \(HFBC\)](#)
- [On-line services and software](#)
- [Terrestrial Frequently Asked Questions \(FAQ\)](#)



### In focus

### Online Tools



**eBroadcasting**  
*(Restricted to TIES users only)*  
[More >](#)

### Contact BCD

[brbcd@itu.int](mailto:brbcd@itu.int)



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GENEVA2022



## *GE84 Compatibility Analysis*

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

## Introduction

The GE84 compatibility analysis tool functionalities can be performed in the following context:

1. When coordinating with affected administrations you may want to perform a more precise examination in order to identify the potentially affected stations and the administrations with which you need to seek agreement.
2. To perform a detailed analysis on frequency assignments published in Part A of the GE84 Special Section in order to assess their impact on your own frequency assignments.
3. To analyze, in your planning process, available frequencies for new sound broadcasting services created using ***GE84\_Optimization tool***.

## Goal

Assess the impact to and from other emissions of a new or existing FM service, in accordance with Article 4 procedure of the Agreement.

The values are calculated by the method contained in Annex 2, Chapter 4, at the transmitter site of the stations which are likely to be affected.



## Exercises

- 1) Generate for the Administration of Togo a new FM station in the town of SOTOBOUA at 89.6 MHz in vertical polarization.
- 2) Evaluate the Nuisance Field Strength (NFS) of this proposed modification to the GE84 Plan on the frequency assignments of the neighbouring administrations already recorded in the Plan.

## Input data

Preparation of the Electronic Notice File (one file per job). The file can be created using:

- **TerRaNotices** tool available on the BRIFIC DVD or,
- **myAdmin** portal or **eQry** database on **eBroadcasting** platform.

**Remark:** This preparation of the Electronic Notice File of Input data is valid for both the **GE84 Compatibility Analysis** and **Optimization** tools.

The compatibility analysis for GE84 is automatically validating the notice file before its submission to the compatibility analysis calculations.

For any other purpose, a validation tool is available in **TerRaNotices** or online by **eValidation** at:

<http://www.itu.int/ITU-R/terrestrial/OnlineValidation/MemberPages/OnlineValidation.aspx>

# Creation and submission to the Compatibility Analysis tool

## TerRaNotices:

1. Create the electronic notice file from scratch or
2. Extract it from the BR IFIC
3. Validate the file online *eValidation*
4. Save the file on your laptop.

(To add notices to the same file , use the “drag& drop” capability in *TerRaNotices*)

The screenshot displays the TerRaNotices 1.2 (PROD) application window. The main interface includes a menu bar (File, Tools, View, Language, Options, Window, Help) and a toolbar with various icons. A 'Notice browser' window is visible in the background, showing a table with columns for 'Notice type' and 'Description'. In the foreground, the 'Wizard (Determine the notice type)' dialog box is open, displaying the following information:

- Administration: TGO
- Fragment: GE84
- Action: ADD
- Sub action: ASSIGNMENT

The 'Action' section of the wizard lists several options with radio buttons: ADD (selected), MODIFY, SUPPRESS, ADMINID, PARTB, COORDINATION, and WITHDRAW. The 'Sub action' section lists ASSIGNMENT (selected). A 'Summary' dialog box is also open, showing the 'Selected options' and a confirmation message: 'Click OK to generate a T01 notice.' The 'Notice type: T01' is displayed at the bottom of the wizard dialog.

# Creation, Validation and submission to the Compatibility Analysis tool (other option)

## eQuery:

1. Define the selection criteria (only one administration), click on the button "*Apply Filter*" to get the summary list and select the notice to be analyzed.
2. Click on the button *Generate e-notices* (export in SGML format).

The screenshot shows the eQuery interface for "Queries on broadcasting plans". The page title is "eQuery: Queries on broadcasting plans" with a subtitle "Readonly daily copy of the BR database (last update: 10 Oct 2022 03:10:02)".

At the top, there are radio buttons for selection criteria: GE06D, GE06L, GE89, **GE84**, ST61, RJ81, GE75, and CAC LIST.

The "Selection Criteria" section has three tabs: Administration, Geographic Area, and Notice Type. The "Administration" tab is active, showing a list of countries in two columns. The left column contains: SRB, SRL, SSD, STP, SUI, SVK, SVN, SWZ, SYR, TCD, TJK. The right column contains: TGO.

On the right side, there are input fields for "Frequency (MHz)" (87.5) and "To" (108). There is also a field for "Identifier assigned by the BR" (SOTOBUA) and a field for "Unique Id. code given by Administration". The "Status" section has checkboxes for "Recorded" and "Published", both of which are checked.

Below the selection criteria, there is a blue button labeled "Apply filter".

Below the "Apply filter" button, there is a blue button labeled "GE84".

At the bottom, there are buttons for "Export to Excel", "Export to PDF", "Google Earth", "Generate e-notices (Export to SGML)" (circled in red), and "Print".

Below the buttons, there is a search bar and a table showing 1 of 1 entries. The table has columns: BR Id, Adm, Site/Allotment Name, Assigned Frequency (MHz), Intent, Coord Completed, ObjectionBy, and Coord Required.

BR Id	Adm	Site/Allotment Name	Assigned Frequency (MHz)	Intent	Coord Completed	ObjectionBy	Coord Required
21010374	TGO	SOTOBUA	93.5	RECORDED			

# myAdmin

(Portal for Focal Points only)

1. Select the administration for the fragment GE84
2. Click on the number of notices corresponding to the group of notices of interest
3. When the summary list appears, it is possible to refine the selection by ticking on **“Use Filter”**
4. Select the notice to be analyzed
5. Click on the button **Generate e-notices** (export en format SGML).

The screenshot displays the MyAdmin interface for the Virtual ITU broadcasting office. The header includes the ITU logo and the text "MyAdmin: Virtual ITU broadcasting office (open 24/7)". Below the header, there is a navigation bar with tabs for "Adm (ITU)", "MailBox", "GE060", "GE84", "GE75", and "MIFR". The "GE84" tab is selected and highlighted with a blue bar and a red notification badge showing "60".

The main content area shows a summary list of notices for the selected fragment. The list is as follows:

Category	Count
Recorded Assignments	<a href="#">83</a>
Notices under treatment	<a href="#">60</a>
Notices under treatment receiving objection	<a href="#">60</a>
Notices under treatment which affect me	<a href="#">388</a>
Comments given in the last period (30 days)	<a href="#">6</a>
Comments received in the last period (30 days)	<a href="#">3</a>
Notices under Coordination Check Review	<a href="#">60</a>


Below the summary list, there is a checkbox labeled "Use filter" which is currently unchecked. A sub-section titled "GE84/TGO" contains several action buttons: "Export to Excel", "Export to PDF", "Google Earth", "Generate TB3", "Generate e-notices (Export to SGML)", and "Print".

The interface also shows a search bar with the text "SOTOUBOUA" and a dropdown menu set to "50" entries. Below this, a table displays the details of the selected notice:

BR Id	Adm	Site Name	Assigned Frequency	Intent	Special Section	End Date(Comments)	Coord Completed	ObjectionBy	Coord Required
<a href="#">121010322</a>	TGO	SOTOUBOUA	97.1	ADD	298		BEN BFA CTI GHA NIG	NGR	BEN BFA CTI GHA NGR NIG

At the bottom right of the interface, there are navigation controls: "Previous", "1", and "Next".

# Notice Generation



eTools: Calculations on-demand

eTools Disclaimer eTools Documentations

The processing system is currently ONLINE (28 processes available)

Please select the calculation type

NoticeGeneration NoticeGeneration

Test Packages (click to show)

Job Input Details (click to hide)

Job Summary Delete Share

Job Id	Status
153262	Success

Job Input (1 File(s))

Adm	E-notice file	Number of Notices
TGO	<a href="#">fodetra_TGO_60_638010127528595132.txt</a>	60

Job Output (click to hide)

Job Output  
fodetra\_TGO\_60\_638010127528595132\_out.txt

```
<HEAD>
t_adm=TGO
</HEAD>
<NOTICE>
t_notice_type=T01
t_fragment=GE84
t_action=ADD
t_adm_ref_id=SOTOBOUA-89.6
t_freq_assgn=89.600000
t_long=+0005845
t_lat=+083421
t_site_name=SOTOUBOUA
t_ant_dir=ND
t_erp_v_dbw=27
t_hgt_agl=50
t_site_alt=377
t_station_id=RADIO MARIA SOTO-2
t_bdwidth=300.000
t_d_adm_ntc=2022-10-06
t_polar=V
t_tran_sys=4
t_eff_hgtmax=89
t_ctry=TGO
<ANT_HGT>
t_eff_hgt@azm0=16
t_eff_hgt@azm10=24
.....
t_eff_hgt@azm350=34
</ANT_HGT>
</NOTICE>
<TAIL>
t_num_notices=1
</TAIL>
```

# Launch the compatibility analysis

1. Login to <https://www.itu.int/ITU-R/eTerrestrial/ECalculations>

2. Choose the options **GE84** and **GE84 Compatibility Analyses**

3. Click on the button **New Calculation**

Remark : the GE84 Compatibility Analysis detailed documentation is available under **eTools Documentation**



## eTools: Calculations on-demand

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

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

Please select the calculation type

**GE84** ▾

**GE84 Compatibility Analyses** ▾

**New Calculation**

∨ **Test Packages** (click to show)

Jobs History for User: fodetra ▾

## 4. Important: Verify the options in the Configuration information

### Configuration Information

Top 20 only    Consider Tip    TV also    Polarization Discrimination (dB) : 10    Use P.1812 propagation model

Trigger NFS from proposed modification for EU calculations (dB ( $\mu\text{V}/\text{m}$ ))  

The users have the possibility to evaluate the prediction of point-to-point interference using the method described in Recommendation ITU-R P.1812 in conjunction with the digital terrain maps (SRTM3).



## 5. Upload the Notice File and submit it (*Submit button*)

GE84 ⌵ GE84 Compatibility Analyses ⌵ [Back to calculation history](#)

**⌵ Job submission** (click to hide)

Please label your submission :

TGO\_SOTOBOUA-89.6MHz

Configuration Information

Top 20 only    Consider Tip    TV also    Polarization Discrimination (dB)     Use P.1812 propagation model

Trigger NFS from proposed modification for EU calculations (dB (μV/m))

Number of files in the Drop-Box: 1

1.2 KB  
TGO\_SOTO...  
[Remove file](#)

[Upload File \(s\)](#) [Submit](#)

# Results

TGO TGO\_SOTOBOUA\_89.6MHz.txt 1

**Configuration Information**

Top 20 only  Consider Tip  TV also  Polarization Discrimination (dB) : 10  Use R,1812 propagation model

Trigger NFS from proposed modification for EU calculations (dB (μV/m)) 30

**Job Output** (click to hide)

**Job Output**

Input notice file validated by the OnlineValidation process on 10/10/2022 5:19:17 PM [GE84 Compatibility Analyses Description](#)

Affected administration All ▾

Showing 1 to 1 of 1 entries Show 25 ▾ entries

Proposed Modification	Administrations with which the limits of 4.3.7.1/4.3.7.2 are exceeded
89.6MHz_SOTOBOUA_000°58'45"E-08°34'21"N-Id:1	

Select the proposed modification

89.6MHz\_SOTOBOUA\_000°58'45"E-08°34'21"N-Id:1 ▾

Result Affected Interferers

Export to Excel

Showing 1 to 9 of 9 entries Show 50 ▾ entries

Assign ID	Adm	Intent	Stn CIs	Assigned Frequency (MHz)	Polar	Site Name	Total Distance (km)	Cold Sea Path (km)	Warm Sea Path (km)	Super refractivity Path (km)	ERP (dBW)	Azimuth (deg)	PR (dB)	NFS	Eu Ref	Proposed Eu	Current Eu	Eu Increase (dB)
121010364	TGO	RECORDED	BC	89.5	V	KARA	111	0	0	0	27	13	25	47.75	80.03	77.67	77.6	0.07
121010373	TGO	RECORDED	BC	89.5	H	TINDJASSI	57	0	0	0	27	279	25	41.61	73.55	71.24	71.17	0.07
110044247	BEN	RECORDED	BC	89.5	V	NATITINGOU	199	0	0	0	27	12	25	40.47	79.46	75.09	75.08	0.01
110044248	BEN	RECORDED	BC	89.7	V	KETOU	223	0	0	0	27	127	25	39.79	82.47	73.01	72.98	0.03

Minimum value of the field strength necessary to permit a desired reception. Eu calculated by the simplified multiplication method, considering the interfering stations listed in "interference from".

Search:

Eu (dB(μV/m))
63.25

Previous 1 Next

## *GE84 Optimization* - Search for new FM frequencies

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

## Optimization Tool

This optimization tool has been developed to achieve efficient use of the 87.5-108 MHz band for analogue sound broadcasting (FM) and to allocate new frequencies for FM broadcasting to meet the growing need for additional frequencies in all administrations that are part of the GE84 Agreement.

It allows the user to submit requirements with flexible frequencies (FLEX) as well as requirements with fixed frequencies to the calculations.

## Introduction of the notion of **flexible frequency requirements**.

In the case of a flexible frequency requirement, the entire FM band (from 87.6 to 107.9 MHz) is analysed in steps of 100 kHz.

The goal is, as first step, to submit *FLEX requirements* in view to identify the most suitable frequencies. In the next steps, the user can start fixing frequencies until all FLEX requirements are assigned with a suitable fixed frequency.

**IMPORTANT:** Flexible frequency requirements will have to disappear before the end of the exercise

## **Purpose**

Assess the impact of an FM requirement to and from other emissions, in accordance with Article 4 Procedure of the GE84 Agreement.

## **Result of analysis**

Search for an assignable frequency based on defined criteria.

# How to use GE84 Optimization tool

The screenshot shows the ITU eTools website interface. At the top, the slogan "Committed to connecting the world" is displayed. Below it, a breadcrumb trail reads "YOU ARE HERE HOME > ITU-R > TERRESTRIAL SERVICES > eTerrestrial". A navigation bar contains links for "eTerrestrial", "eMIFR", "eValidation", "WISFAT", and "eBroadcasting". A secondary navigation bar includes "eQuery", "ePub", "eTools", and "MyAdmin". The main content area features a large heading "eTools: Calculations on-demand" with a circular icon containing a calculator and network nodes. Below this, there are links for "eTools Disclaimer" and "eTools Documentations". A status message indicates "The processing system is currently OFFLINE (0 processes available)". A form prompts the user to "Please select the calculation type" with two dropdown menus: "GE84" and "GE84 Optimization". A "New Calculation" button is visible to the right. An "eTools Documentations" modal window is open on the right side, listing various documentation items. The item "GE84 Optimization: English | Français | Español" is circled in red. A "Close" button is located at the bottom right of the modal.

**eTools Documentations**

- WRS2020 presentation
- eTools How To: Privacy and Job Sharing
- Calculations for testing and coordination purposes
  - GE06D Article 4 Plan modification (Coordination and Conformity Examination)
  - RJ81 calculations
  - RJ81 Article 4 Plan modification: results description
- CA\_Compact Compatibility Analyses : English | Français | Español
- GE84 Compatibility Analyses: English | Français | Español
- GE84 Optimization: English | Français | Español**

Close

# Exercise: Preparation of flexible requirement

Prepare a requirement (notice) on **flexible channel** assigned to a sound broadcasting station based on the information from the previously generated notice SOTOBOUA-89.6, using *TerRaNotices* tool and selecting the Administration of TGO as notifying administration.

Date of notification: 6/10/2022 ID1/ Unique Identification code given by the Administration to the assignment: SOTOBOUA-FLEX **T01**

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: Station information

4A/ Antenna site name: SOTOBOUA 4C/ Longitude: 0° 58' 45" E 9EA/ Altitude of site above sea level: 377 m 3A1/ Call sign: [ ]

4B/ Geographic area: TGO Latitude: 8° 34' 21" N 3A2/ Station identification: FLEX

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.: 27 dBW

Antenna characteristics

9/ Antenna directivity: ND 9EB/ Maximum Effective Antenna Height: 89 m 9E/ Height of Antenna Above Ground Level: 50 m

Coordination successfully completed with the following available administration/elected administration:

AFG [ ] Add > AFS [ ] < Remove AGL [ ] << Clear

13C/ Notified remarks: [ ]



1. Login to : <https://www.itu.int/ITU-R/eTerrestrial/eBroadcasting> (TIES account needed)
2. Select the *GE84 Optimization* option.
3. Push the button *New Calculation*
4. *Submit the electronic notice* file(s) to *eTools* for *GE84 Optimization* by uploading the notice file(s) previously prepared.
5. Important: check the options in the *configuration information*.
6. *Upload the electronic notice* file(s)
7. Finally submit the uploaded notice file(s) (*Submit button*).

Note: You will be notified at your TIES email account when the job is complete. You can also monitor the status of your submission by going *back to the calculation history*.



The processing system is currently **OFFLINE** (0 processes available)

Please select the calculation type

GE84



GE84 Optimization



New Calculation

### ↑ Test Packages (click to hide)

Jobs History for User:

fodetra



Excel

PDF

Print

Delete Selected Job(s)

Refresh all

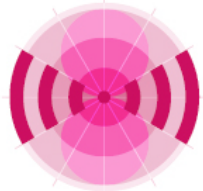
Showing 1 to 5 of 5 entries

Show

25



entries



# Result

Please select the calculation type

GE84

GE84 Optimization

New Calculation

Test Packages (click to hide)

Job Input Details (click to hide)

## Job Summary

Delete

Share

Job Id	Job name	Status
19642	TGO_SOTOBOUA_FLEX	Success

## Job Input (1 File(s))

Adm	E-notice file	Number of Notices
TGO	<a href="#">TGO_SOTOBOUA_FLEX.txt</a>	1

## Configuration Information

(only results with Nuisance Field Strength (NFS)  $\geq 30$  dB ( $\mu$ V/m) will be displayed):

Consider Tip  TV also  Polarization Discrimination (dB) : 10  Use P.1812 propagation model

Job Output (click to hide)

## Job Output

Input notice file validated by the OnlineValidation process on 10/11/2022 4:44:35 PM

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

Select Analysis option

Select Administration

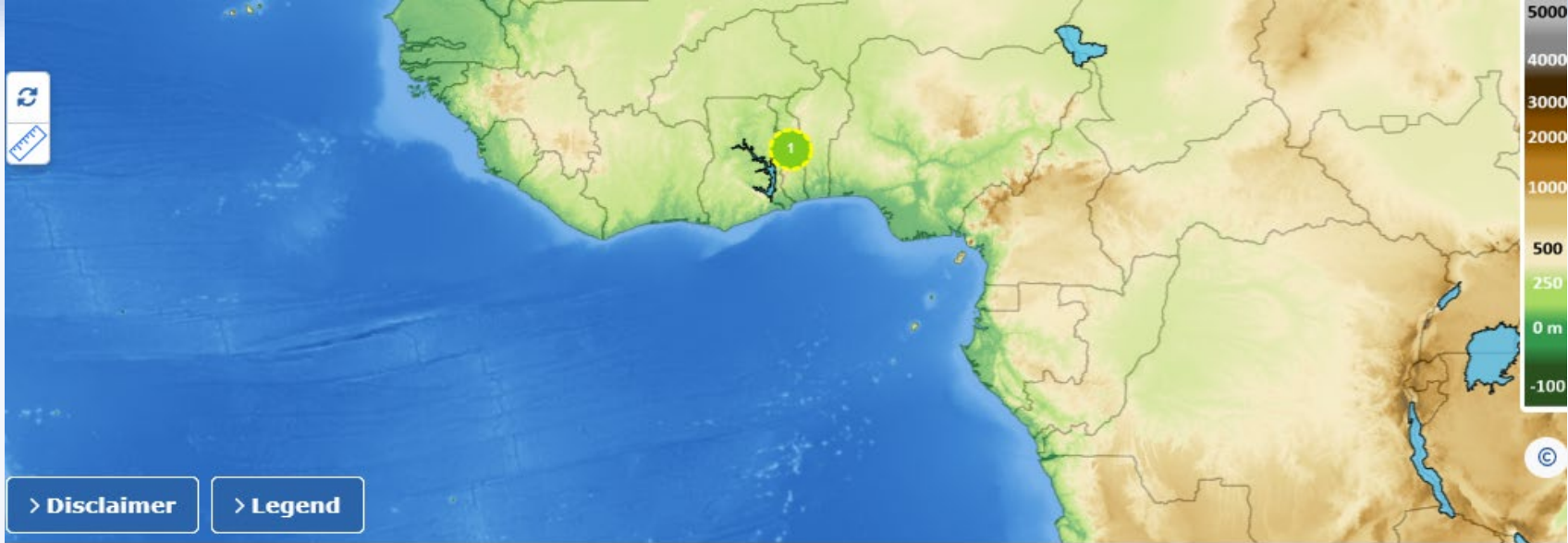
Evaluate Statistics

TGO

Evaluate Statistics

Adm	Submitted	Assignable	Non Assignable
TGO	<a href="#">1</a>	<a href="#">1</a>	0





Showing results for submitted requirements from TGO

Select requirement (1):  
 SOTOUBOUA | FLEX (000°58'45"E-08°34'21"N) System 4 POL V - Id: 1 (ADD)

Details of the requirement under consideration (click to show)

Summary [ SOTOUBOUA | FLEX (ADD) ]

Show top 5 interferers in the summary
  Show top 5 affected in the summary
  Show assignable frequencies on top
 [GE84 Optimization Description](#)

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	
104.1	44.22	43.36	<a href="#">110043411</a>	BEN	RECORDED	BC	104.2	V	KABOUA	191	0	0	0	27	100.7	25	<a href="#">43.36</a>
			<a href="#">110043410</a>	BEN	RECORDED	BC	104.2	V	BOUKOUMBE	182	0	0	0	27	4.2	25	<a href="#">41.38</a>
			<a href="#">110051597</a>	BEN	RECORDED	BC	104	V	LOKOSSA	230	0	0	0	27	159.4	25	<a href="#">39.57</a>
100.5	45.09	37.71	<a href="#">110044305</a>	BEN	RECORDED	BC	100.6	V	MATERI	237	0	0	0	27	2.8	25	<a href="#">37.71</a>
			<a href="#">122024396</a>	CTI	RECORDED	BC	100.5	V	Bondoukou F	420	0	0	0	27	262.2	37	<a href="#">32.79</a>
			<a href="#">111056457</a>	GHA	RECORDED	BC	100.5	V	CAPE COAST	460	0	20	0	27	213.2	37	<a href="#">30.89</a>
99.8	46.17	42.73	<a href="#">110044302</a>	BEN	RECORDED	BC	99.7	V	PARAKOU	199	0	0	0	27	64	25	<a href="#">42.73</a>



# Thank you!

ITU – Radiocommunication Bureau

Questions to [brmail@itu.int](mailto:brmail@itu.int) or [xxxx@itu.int](mailto:xxxx@itu.int)

