FM Broadcasting Optimization tool

1. ***Introduction***:

This optimization 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.

The software is running field strength calculations at the transmitter site with respect to the following entries:

- Assignments in the GE84 Plan (recorded assignments and, possibly, proposed modifications), in the frequency band 87.5-108 MHz.
- ST61 Plan entries recorded in the frequency band 87.5-100 MHz, if appropriate.
- All the FM requirements present in the file or group of files submitted to the calculations. Please note that, contrary to the other GE84 tools, multiple files can be submitted. The only constraint is that only one file can be submitted per administration.

The tool evaluates the levels of interference received as well as generated from and to the entries listed above, on a channel-by-channel basis considering co- and adjacent channel interference, in accordance with the GE84 Agreement.

The summary of the GE84 procedure on Article 4 and the relevant flowchart are available at: http://www.itu.int/en/ITU-R/terrestrial/broadcast/Pages/FMTV.aspx

This new functionality, which can be accessed using a TIES user account, is part of ***eBroadcasting*** and can be found under ***eTools*** at: https://www.itu.int/ITU-R/eTerrestrial/ECalculations

The GE84 optimization tool allows the user to submit requirements with flexible frequencies (FLEX)[1] as well as requirements with fixed frequencies to the calculations. The goal is, as a first step, to submit FLEX requirements in view to identify the most suitable frequencies. In the next steps, the user can start fixing the frequencies until all the FLEX requirements are assigned with an appropriate fixed frequency.

The notice form T01 is to be used for the notification of an assignment to a VHF sound broadcasting station. The tool is also accepting TB5 notices forms to simulate "withdrawals of TIP notices" or "Suppression of RECORDED assignments" in the Plan. A guide is available at:

https://www.itu.int/en/ITU-R/terrestrial/tpr/Pages/FMTVNotices.aspx#FMTVNotices

2. ***Description of the GE84 Optimization module:***

2.1.1. Purpose

Assess the impact of an FM requirement to and from other emissions, in accordance with Article 4 procedure of the Agreement. The values are calculated by the method contained in Annex 2,

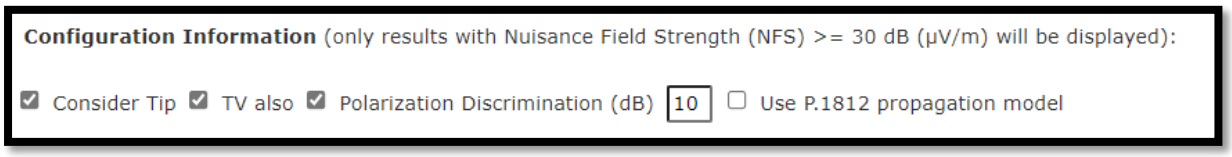
[1] Please see the definitions at the end of the document

Chapter 4, at the transmitter site of the stations which are likely to be affected. The tool evaluates all the interferers identified within a 1'500 km radius from the given station/proposed requirement producing an NFS ≥ 30 dB(µV/m) for a specific frequency and adjacent frequencies up to ± 400 kHz using 100 kHz steps.

By default, for prediction purposes, the propagation methods described in Chapter 2 of Annex 2 to the GE84 Agreement are used.

The users also 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 a digital terrain map (SRTM3) with 90 m resolution. For that purpose, an additional option has been added to the configuration information.

2.1.2. Options:



- Consider Tip:

By default, the ongoing modifications to the GE84 Plan (TIP notices) are considered. The assignments recorded in the GE84 Plan are also considered.

If this option unchecked, TIP notices are not considered in the calculations.

- Consider TV station:

By default, the television stations recorded in the ST61 Plan, are considered in the calculations.

If this option is unchecked, only FM stations are considered.

- Consider Polarization discrimination:

By default, a polarization discrimination of 10 dB is considered in the calculations, in accordance with §3.8.3 of Chapter 3 of Annex 2 to the GE84 Agreement. This value can be changed.

If this option is unchecked, no polarization discrimination will be applied.

- Use P.1812 propagation model:

If this option is selected, the detailed calculations will be performed using the propagation model described in Recommendation ITU-R P.1812 taking into account SRTM3 terrain data. Please note that, for this mode, the calculation time is significantly longer.

2.1.3 Input:

Electronic Notice File (one file per job).

The electronic notice files can be created in two ways:

1) using ***TerRaNotices*** from the BRIFIC DVD
2) using **myAdmin** or **eQry** as follows:
    - **eQry**: define the selection criteria (one administration only), push the button *Apply Filter* to display the summary list for selected notices,
    - **myAdmin**: click on the number of notices corresponding to the group of notices of interest to display the summary list for selected notices. It is possible to further refine the selection criteria by ticking the checkbox Use Filter.

To generate the e-notices in both cases push the button Generate e-notices (Export to SGML). When the notice file is ready, an email is sent to the TIES user mailbox and the output notice file is available for download from eTools (Notice Generation option).

Important: It is highly recommended to previously validate the files using the web-based on-line validation tool available at:

https://www.itu.int/ITU-R/eTerrestrial/ or
https://www.itu.int/ITU-R/eTerrestrial/eValidation

2.1.4 Output:

- Interference field strength (NFS) to and from your requirement(s) to other stations (identified as affected & interferers)
- identification of the highest NFS received and generated.
- Identification of the assignable frequencies based on the options selected by the user.
- Consideration of coordination information (only for the requirements with a fixed frequency)

3. *How to use GE84 Optimization tool*:

3.1. Electronic notice preparation

Prepare and validate your notice files as mentioned in section 2.1.3 above and save the files on your computer.

Important notes:

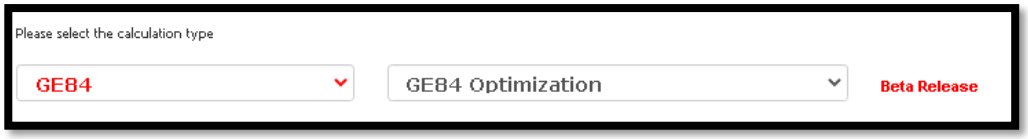
If your files contain fixed frequency requirements (frequency & coordinates) already RECORDED in the Plan, make sure that you are submitting a "MODIFY" notice targeting the RECORDED entry to avoid validation errors

Run the calculations by submitting one or multiple input files composed of one or multiple T01 and, possibly, TB5 notices (multiple files allowed but only one per administration). It is important to note that, in this tool, the impact of the wanted requirement with respect to other requirements present in the file is also assessed.

3.2. Start GE84 Optimization

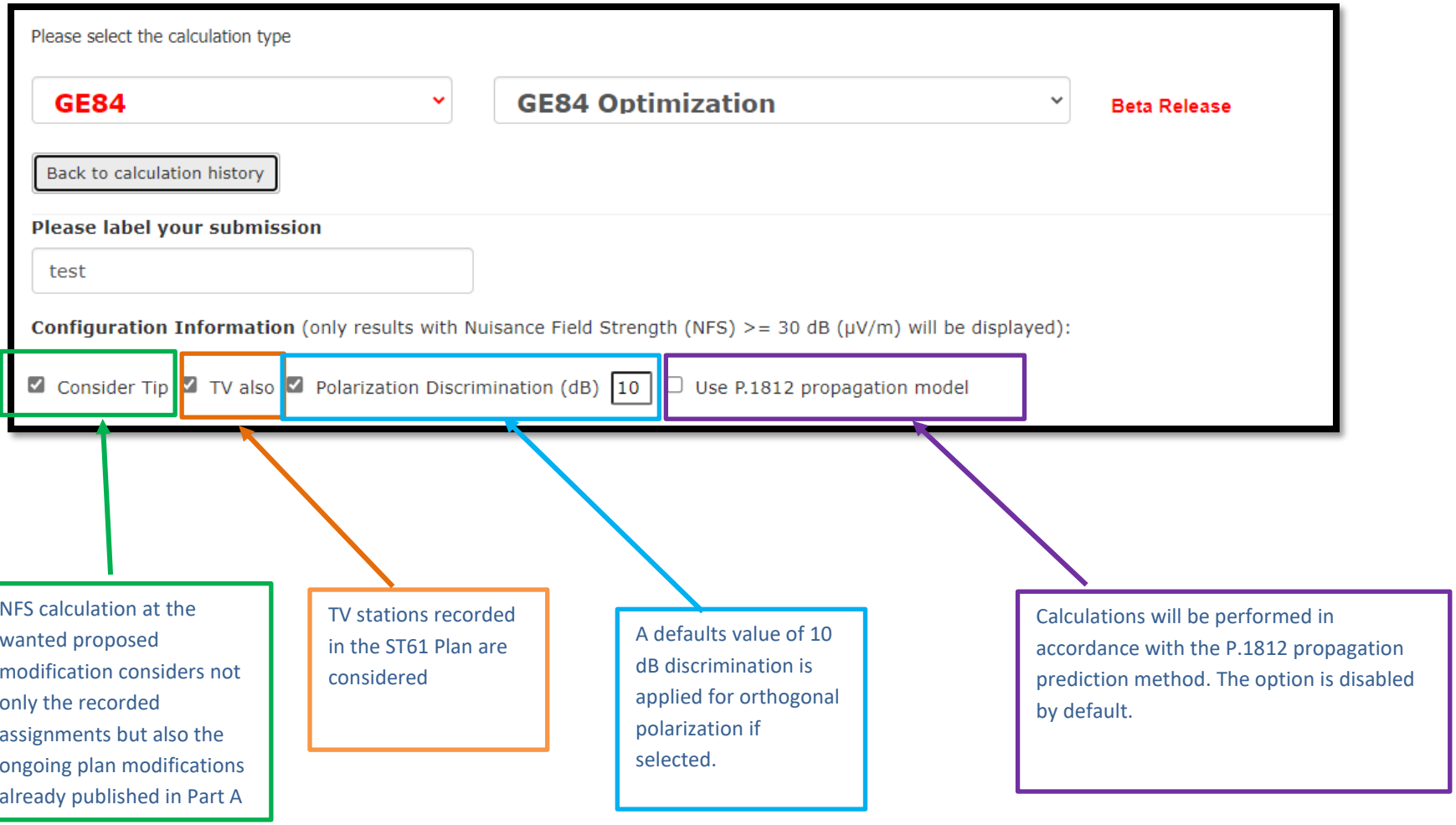
1. Login to : https://www.itu.int/ITU-R/eTerrestrial/ECalculations(TIES account needed).

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).

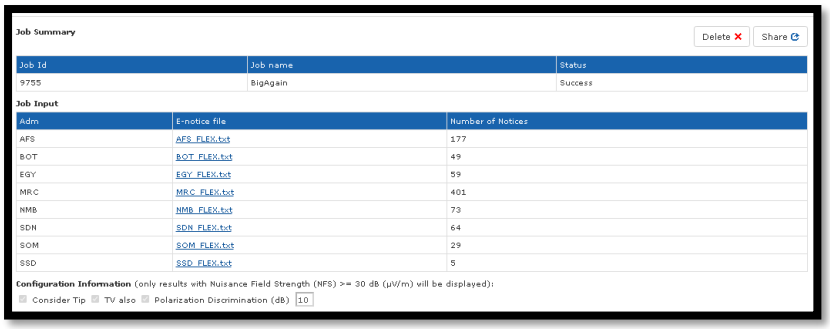
Note: You will be notified at your TIES email account when the job is complete. You can also monitor the status of your submission by going back to the calculation history.


Please select the calculation type
GE84
GE84 Optimization
Beta Release
Back to calculation history
Please label your submission
test
Configuration Information (only results with Nuisance Field Strength (NFS) >= 30 dB (µV/m) will be displayed):
Consider Tip
TV also
Polarization Discrimination (dB)
10
Use P.1812 propagation model
NFS calculation at the wanted proposed modification considers not only the recorded assignments but also the ongoing plan modifications already published in Part A
TV stations recorded in the ST61 Plan are considered
A defaults value of 10 dB discrimination is applied for orthogonal polarization if selected.
Calculations will be performed in accordance with the P.1812 propagation prediction method. The option is disabled by default.

4. *Results of the GE84 Optimization analysis*

a. Summary of your submission

When the user clicks on a specific job ID, a summary of the submission, together with the options selected is displayed:



Job Summary Delete Share

Job Id	Job name	Status
9755	BigAgain	Success

Job Input

Adm	E-notice file	Number of Notices
AFS	AFS_FLEX.txt	177
BOT	BOT_FLEX.txt	49
EGY	EGY_FLEX.txt	59
MRC	MRC_FLEX.txt	401
NMB	NMB_FLEX.txt	73
SDN	SDN_FLEX.txt	64
SOM	SOM_FLEX.txt	29
SSD	SSD_FLEX.txt	5

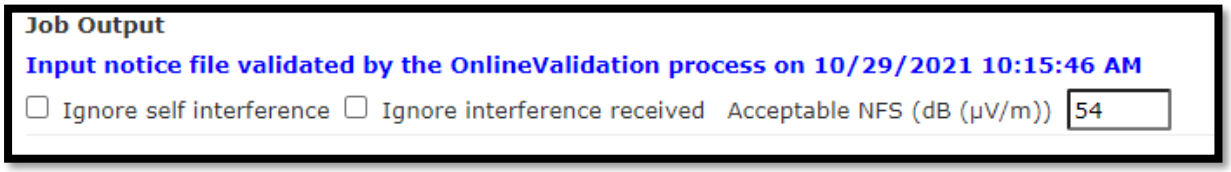
Configuration Information (only results with Nuisance Field Strength (NFS) >= 30 dB (µV/m) will be displayed):

Consider Tip TV also Polarization Discrimination (dB) 10

Please note that the user can delete the job or share it with other users (see the delete and share buttons on the top right corner of the screen above)

b. Statistics

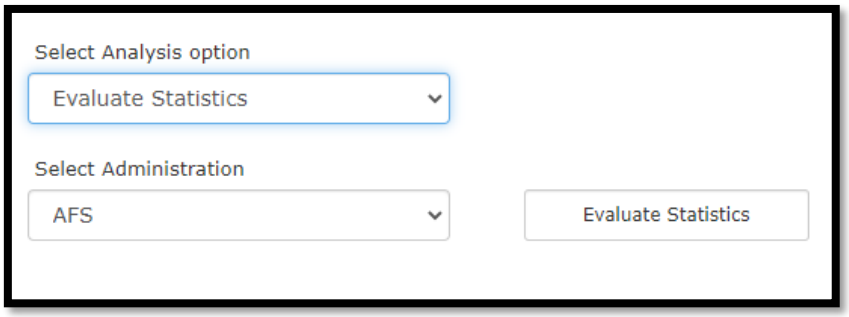
The user needs to select the options to be applied to the statistics for the identification of assignable channels.



Filtering options having an impact on the statistics:

- Selecting a high value acceptable NFS, disregarding self-incompatibilities between stations within an administration, ignoring incoming incompatibilities must be done with great care.
- By default, the acceptable NFS is set to 54 dB(µV/m). All the requirements having at least one frequency for which the highest NFS generated and the highest NFS received are both less than or equal to 54 dB(µV/m) are shown as assignable.
- Ignoring interference received is appropriate under specific terrain conditions (e.g. if there are natural obstacles at the border between two countries. P1812 point-to-point calculations, using terrain data, can be performed to evaluate the impact of terrain).
- Ignoring self-interference will disregard all the incoming and outgoing interference from stations within the same administration. Self-incompatibilities should be resolved before bringing a frequency assignment into operation.
- By default, calculations are based on the method contained in Annex 2, Chapter 4 of the GE84 Agreement. If the user selects to use the P.1812 propagation model, all the FS calculations will be based on this P.1812 model.

c. Summary concerning the status of the requirements (after the selection above is made)



After selecting "Evaluate statistics", the information is displayed for a specific Administration and shows

- The number of requirements present in each file
- their status (assignable or not assignable), based on the options selected above (see b.).

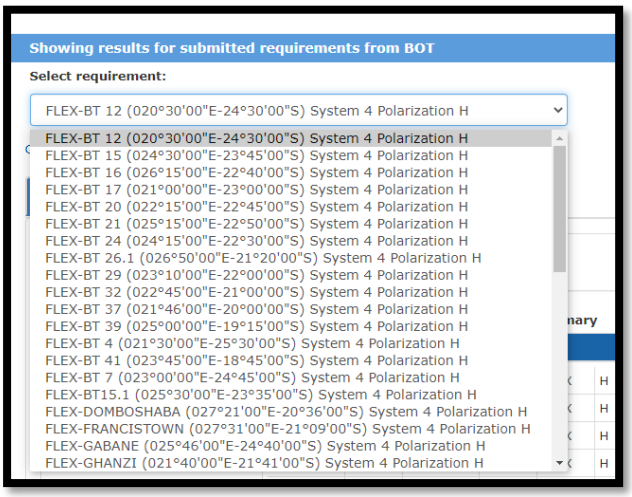
Adm	Submitted	Assignable	Non Assignable
AFS	838	27	811

The user can click on any of the links displayed on the screen above to get the list of requirements to be analyzed in detail.

d. Detailed results

1. **List of requirements corresponding to the selected link**

The list of requirements under consideration is shown and the user can select the appropriate requirement to be examined further:



2. **Summary list for a selected requirement**

When the requirement is selected, the details are presented as follows.

- If the requirement contains a flexible frequency (FLEX), the details for the calculations with respect to the other relevant FLEX requirements submitted appear first.

- Then the tool displays the incompatibilities, on a frequency-by-frequency basis, considering co- and adjacent channel interference, including:
    - stations already recorded in the GE84Plan
    - ongoing modifications (TIP notices) to the GE84 Plan
    - Television stations recorded in the ST61 Plan
    - requirements with a fixed frequency

  In practice, the calculations loop through the entire FM band, in steps of 100 kHz, simulating the assignment of frequencies to the proposed requirement, identifying all relevant incompatibilities for each assigned frequency, as described above.

3. **Selection of the information to be displayed** (either the top 5 interferers or the top 5 affected):

- The first lists of incompatibilities are displayed only for the top 5 incompatibilities, to provide a quick overview of the situation for each frequency.

89.5	158.95	158.95	2	AFS	ADD	BC	89.5	V	AUGRABIES	1	0	0	0	37	0	45	158.95
			084000453	AFS	RECORDED	BC	89.6	H	MIER	208	0	0	0	47	177.3	25	54.69
			084000375	AFS	RECORDED	BC	89.4	H	STEINKOPF	280	0	0	0	47	78.9	25	51.27
			084000459	AFS	RECORDED	BC	89.4	H	DEBEERSRUS	282	0	0	0	47	218.6	25	47.37
			084000297	AFS	RECORDED	BC	89.4	H	CARNARVON	322	0	0	0	47	323.3	25	47.15

- Show assignable frequencies on top: This option can be used in the case of requirements with a flexible frequency (FLEX). If it is selected, the assignable frequencies will be displayed on top, using a cascade sorting in the following order of precedence: NFS received, NFS generated.

4. **Presentation of mutual incompatibilities between requirements with a flexible frequency (FLEX) present in the submission**

   For the selected requirement, if it is a "requirement with a flexible frequency" (see FLEX in front of the site name in the list), the results are as follows:

   i. The requirement is analyzed <u>only</u> against the other flexible requirements present in the file which are subject to incompatibilities (received and/or generated by the FLEX requirement under consideration). This information may not be displayed if the notices submitted to the job contain only one FLEX requirement, or if it contains multiple FLEX requirements having no mutual incompatibilities. This information informs the user on the flexible requirements which can be assigned as co-channel (if the NFS generated and received are ≤ the acceptable NFS value, visible in green. Otherwise, the user knows that the same frequency cannot be assigned to both requirements). As no frequency has been assigned yet, the flexible requirements are all shown as "FLEX".

   ii. The first screen is showing only the top 5 interferers and affected stations with a flexible frequency. When you click on FLEX in the Frequency column, you get the full list of incompatible requirements with a flexible frequency for the selected/wanted requirement.

   iii. In the case where the NFS received and generated by another FLEX requirement is ⩽ the acceptable NFS value, the requirement is identified in green.

Example: In the extract below, we can assume that our wanted requirement from AFS cannot be assigned the same frequency as requirement ARIAMSVLEI from NMB.

◉ Show top 5 affected in the summary ○ Show top 5 interferers in the summary

Frequency (MHz)	Top five affected														
FLEX	2	NMB	ADD	BC	FLEX	V	ARIAMSVLEI	73	0	0	0	37	310.9	45	90.24

○ Show top 5 affected in the summary ◉ Show top 5 interferers in the summary

Frequency (MHz)	Top five interferers														
FLEX	2	NMB	ADD	BC	FLEX	V	ARIAMSVLEI	73	0	0	0	37	131.1	37	79.11

5. **"What if" study, showing incompatibilities simulating the assignment of a frequency to the wanted station, scanning through the whole FM band in steps of 100 kHz.**

Below the analysis of FLEX against FLEX requirements, the tool presents, for each frequency in steps of 100 kHz, the following information

- the maximum NFS generated by the wanted requirement to the affected stations
- the maximum NFS received by the wanted requirement from the interfering stations
- the 5 highest incompatibilities (interferers or affected stations, excluding the FLEX requirements),

◉ Show top 5 affected in the summary ○ Show top 5 interferers in the summary

Excel

Frequency (MHz)	Max NFS Generated (dB(µV/m))	Max NFS Received (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.
87.6	110.95	120.95	084000411	AFS	RECORDED	BC	87.8	H	AUGRABIES	1	0	0	0	37	0	7	110.95	---
			084000279	AFS	RECORDED	BC	87.6	H	GARIES	297	0	0	0	37	228.5	37	48.9	---
			084002194	NMB	RECORDED	BC	87.6	H	KEETMANSHOOP	314	0	0	0	37	314.1	37	46.65	---
			084000363	AFS	RECORDED	BC	87.7	H	PRIESKA	249	0	0	0	37	120.5	25	40.76	---
			084000255	AFS	RECORDED	BC	87.6	H	BEAUFORT WEST	457	0	0	0	37	154.3	37	33.7	---
87.7	136.95	146.95	084000411	AFS	RECORDED	BC	87.8	H	AUGRABIES	1	0	0	0	37	0	33	136.95	---
			084000363	AFS	RECORDED	BC	87.7	H	PRIESKA	249	0	0	0	37	120.5	37	52.76	---
			084000279	AFS	RECORDED	BC	87.6	H	GARIES	297	0	0	0	37	228.5	25	36.9	---
			084002194	NMB	RECORDED	BC	87.6	H	KEETMANSHOOP	314	0	0	0	37	314.1	25	34.65	---

frequency assigned to the proposed modification for the simulation

Identification of the highest levels of interference generated by the wanted station (proposed requirement) for each analyzed frequency

Identification of the highest levels of interference received by the wanted station (proposed requirement) for each analyzed frequency

Top 5 frequency assignments/requirements from the exhaustive list of interferers or affected depending on the selection made above.

a- **Exhaustive list of interfering (interferers) or affected stations for a specific frequency**.
When the user clicks on a specific frequency, a new tabulation appears to present the full list of contributors causing an interference level ≥ 30 dB(µV/m). If "consider TIP" is not selected, only the RECORDED assignments are considered. If the user clicks on the *AssignID*, the details of the assignment are shown (see Intent column). Here the last entry is a TIP entry, in process and not yet recorded)

Summary [FLEX-AUGRABIES (020°24'00"E-28°34'00"S) System 4 Polarization V] | 87.6MHz | List of Affected | 87.6MHz | List of Interferers

Excel

Assign ID	Adm	Intent	Stn Cls	Assigned Frequency (MHz)	Polar	Site Name	Total Distance	Cold Sea Path (Km)	Warm Sea Path (Km)	Super refractivity Path (Km)	ERP (dBW)	Azimuth (deg)	Protection Ratio (dB)	NFS (dB(µV/m))
084000411	AFS	RECORDED	BC	87.8	H	AUGRABIES	1	0	0	0	47	0	7	120.95
084002194	NMB	RECORDED	BC	87.6	H	KEETMANSHOOP	314	0	0	0	47	135.1	37	56.9
084000363	AFS	RECORDED	BC	87.7	H	PRIESKA	249	0	0	0	47	299.4	25	52.08
084000279	AFS	RECORDED	BC	87.6	H	GARIES	297	0	0	0	37	49.6	37	50.41
084000255	AFS	RECORDED	BC	87.6	H	BEAUFORT WEST	457	0	0	0	47	333.3	37	44.13

Details of the assignment. For more details, click on the Assign ID.

Total distance and sea path site to site. Note that the sea paths are not displayed for P.1812 calculation results (see the model elements in the Rec.).

e.r.p .at pertinent azimuth

Azimuth from the contributor to the proposed requirement

Field Strength of the interfering transmitter (at pertinent azimuth) modified by the pertinent protection ratio and polarization discrimination if it applies

Pertinent protection ratio (see Tables 2.1 to 2.3 of Annex 2 of GE84 Agreement) depending on: Frequency spacing, Transmission System and Steady/tropospheric interference

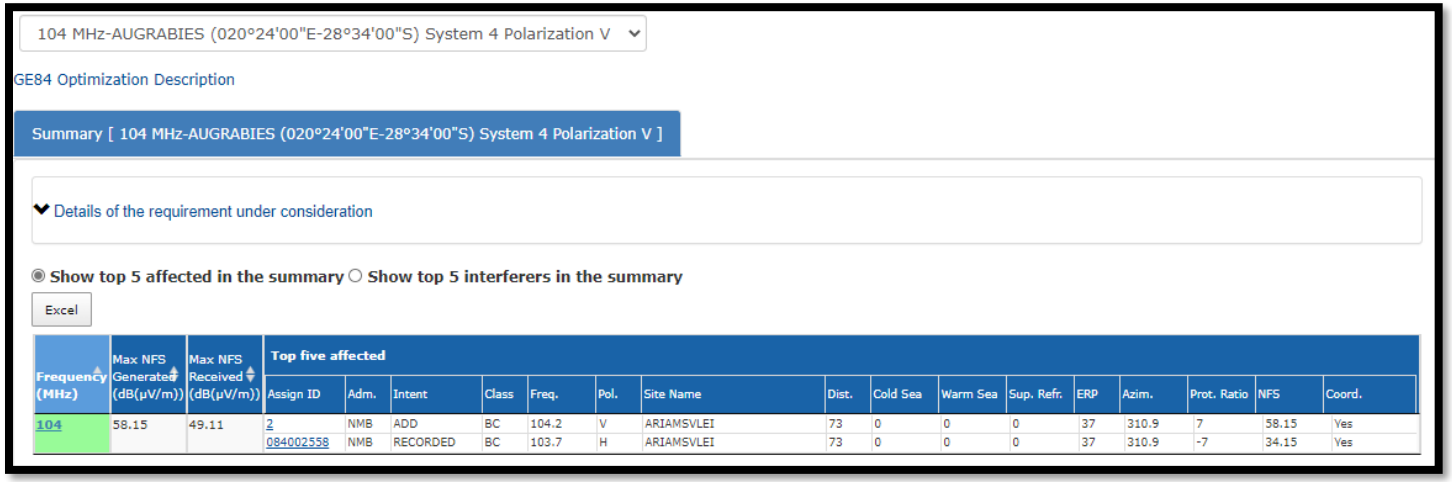
5. ***Consideration of coordination information*** :

a. The coordination information submitted in the notice form is considered only for requirements with a fixed frequency. It is ignored when submitted with requirements with a flexible frequency.

b. When a fixed requirement is affecting fixed requirements or Plan entries from a neighboring country by more than the acceptable NFS captured, the affecting administration has the possibility to coordinate the affecting requirement with the affected administration. If the affected administration agrees, the requirement can be submitted with an additional <COORD> section where the symbol of the administration which gave its agreement is specified.

c. The impact of coordination information on the definition of assignable channels is as follows:

i. All the requirements and Plan entries of the affected administration will be considered as “coordinated” and <u>the level of interference received from the coordinated requirement will be disregarded</u>. In the example below, only NMB is affected by the requirement from AFS. If AFS coordinates it requirement with NMB, the coordination information has precedence over the level of NFS generated to the stations from NMB. The coordination is visible in the column “Coord.”.



Frequency (MHz)	Max NFS Generated (dB(µV/m))	Max NFS Received (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	58.15	49.11	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

ii. In addition, when we select the requirement from NMB, the requirement from AFS (Assign ID 1) will be identified as a coordinated interferer for NMB and, if the user does not ignore interference received in the initial selection for the statistics, the level of NFS generated by the coordinated interferer will not be evaluated, as coordination has precedence over the acceptable value of NFS. In the example below, if the user does not disregard interference received, the requirement from NMB, ARIAMSVLEI 104.2 MHz is considered as having all the interference received acceptable. (One is coordinated and the remaining 3 are generating an NFS below the acceptable value of 54 dB(µV/m) captured by the user).

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

GE84 Optimization Description

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

Details of the requirement under consideration

○ Show top 5 affected in the summary ◉ Show top 5 interferers in the summary

Excel

Frequency (MHz)	Max NFS Generated (dB(µV/m))	Max NFS Received (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.
104.2	49.11	58.15	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	---

iii. Because ARIAMSVLEI 104.2 MHz does not affect any requirement or Plan Entry by more than the acceptable NFS of 54 dB(µV/m) captured by the user, 104.2MHz is considered as assignable. It will not be the case if ARIAMSVLEI 104.2 MHz were affecting other requirements or Plan Entries by more than the acceptable value.

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

GE84 Optimization Description

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

Details of the requirement under consideration

◉ Show top 5 affected in the summary ○ Show top 5 interferers in the summary

Excel

Frequency (MHz)	Max NFS Generated (dB(µV/m))	Max NFS Received (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.
104.2	49.11	58.15	1	AFS	ADD	BC	104	V	AUGRABIES	73	0	0	0	37	131.1	7	49.11	---
			084002199	NMB	RECORDED	BC	104.3	H	KEETMANSHOOP	241	0	0	0	37	315.4	25	37.41	---
			084000284	AFS	RECORDED	BC	104.3	H	GARIES	296	0	0	0	37	214.5	25	32.36	---

6. P1812 calculations "on-the-fly"

This option can be performed by left mouse clicking on the NFS value. It is accessible from GE84 results as well as from the P.1812 results. A new screen is displayed, showing the data submitted to the calculations. The data displayed can be changed by the user to see the impact of those changes on the results.

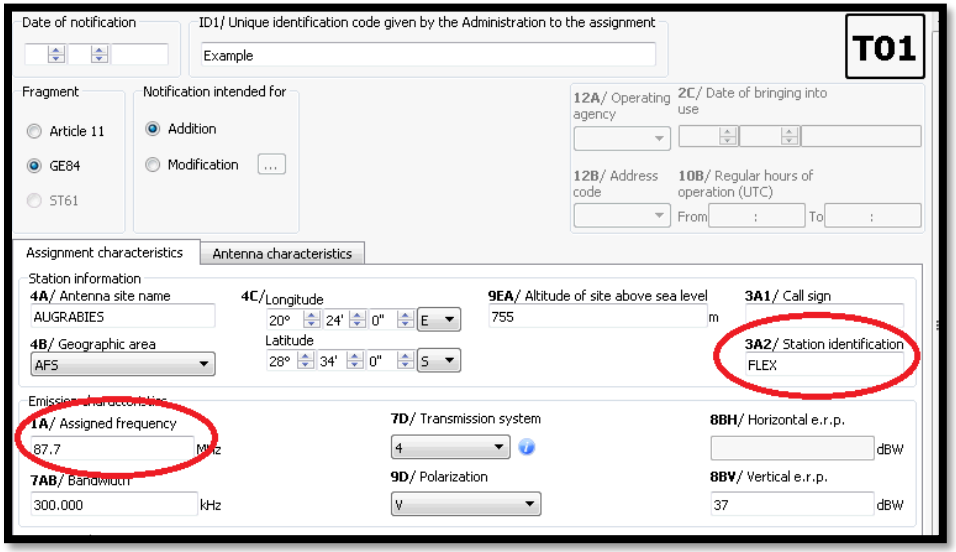
To launch the calculations, the user must click on the “submit” button and to get the results, it is necessary to click on the “refresh” button when it is enabled. This tool provides more detailed information, for example the altitude of the terrain coupled with the FS calculated along the path.

7. ***Some definitions***:

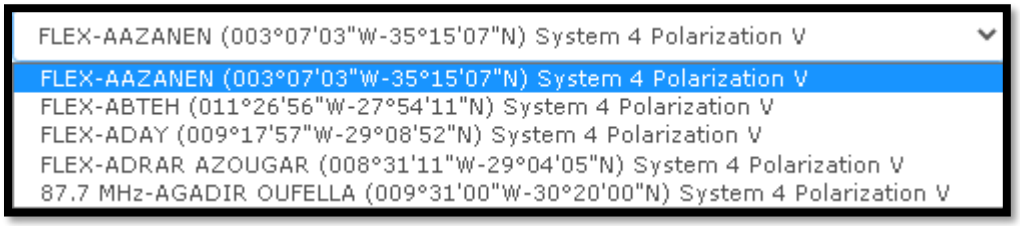
Requirement with a flexible frequency

In the case where the user wants to analyze the situation of an FM requirement for all the frequency channels of the FM frequency band, the requirement should contain the following information:

- Assigned frequency = frequency 87.7 MHz
- station identification = FLEX



For the requirements with a flexible frequency, the software will scan the FM band on a frequency-by-frequency basis, in steps of 100 kHz, to assess incompatibilities. Such requirements can be easily identified in the list of requirements as its designation contains FLEX whereas a fixed requirement will have its assigned frequency shown instead:



Assignable requirement on an assignable frequency

Refers to the requirement having one or more assignable frequencies, which are determined by the planning software to be compatible with the GE84 assignments to *FM broadcasting services*, with the requirements with a fixed frequency and, if relevant, with the assignments to *Analog Television* present in the ST61 Plan in the frequencies shared with the FM band. The assignable frequencies, which depend on the options selected, are identified in green:

87.8	58.03	69.38	107105823	MRC	ADD	BC	87.8	V	EL AIOUN DU DRAA	101	0	48	0	23	48.9	37	58.03	---
			107105222	MRC	ADD	BC	87.8	V	AKHFENIR	63	0	0	0	23	290.5	37	56.29	---
			107107148	MRC	ADD	BC	87.7	V	TIGLIT	129	0	23	0	23	59.8	25	40.79	---
			113030593	MRC	ADD	BC	87.9	V	Mireleft	237	0	98	0	23	37.8	25	39.19	---
			107106179	MRC	ADD	BC	87.7	V	JDIRIA	125	0	0	0	23	125.3	25	38.91	---
87.9	54.48	62.31	119085499	MRC	ADD	BC	88	V	El Ouatia	66	0	6	0	23	9.5	25	54.48	---
			113030593	MRC	ADD	BC	87.9	V	Mireleft	237	0	98	0	23	37.8	37	51.19	---
			119085474	MRC	ADD	BC	87.9	V	Agadir Oufella	332	0	238	0	23	31.7	37	48.69	---
			107105844	MRC	ADD	BC	87.9	V	EL FARCIA	183	0	0	0	23	118.5	37	47.69	---
			107105823	MRC	ADD	BC	87.8	V	EL AIOUN DU DRAA	101	0	48	0	23	48.9	25	46.03	---

Non-Acceptable frequency

In the case where the wanted requirement already has a frequency assigned in the GE84 Plan (easily identified by the distance = 1km), it is advised not to assign, not only this same frequency (as it is already assigned) to the requirement under consideration, but also the frequencies in the 1st, 2nd and 3rd adjacent channels. Those frequencies are identified in light red.

90.2	92.95	92.95	119033078	MRC	RECORDED	BC	90.5	V	ABTEH	1	0	0	0	23	0	-7	92.95	---
			107106093	MRC	ADD	BC	90.2	V	HAOUZA	100	0	0	0	23	153.3	37	52.7	---
			105097389	MRC	RECORDED	BC	90.2	V	TARFAYA	144	0	16	0	23	271.7	37	51.09	---
			116111694	MRC	ADD	BC	90.2	V	FOGO	201	0	60	0	23	43.6	37	50.87	---
			107105949	MRC	ADD	BC	90.2	V	ESSAOUIRA VILLE	432	0	375	0	23	22.1	37	45.03	---
90.3	106.95	106.95	119033078	MRC	RECORDED	BC	90.5	V	ABTEH	1	0	0	0	23	0	7	106.95	---
			084004647	MRC	RECORDED	BC	90.3	H	TAN TAN	73	0	24	0	23	23.7	28	44.93	---
			107105585	MRC	ADD	BC	90.3	V	BIR LAHLOU	259	0	0	0	23	131.9	37	44.02	---
			117117221	MRC	ADD	BC	90.3	V	ASKAL	370	0	191	0	23	34	37	42.49	---
			107106093	MRC	ADD	BC	90.2	V	HAOUZA	100	0	0	0	23	153.3	25	40.7	---
90.4	132.95	132.95	119033078	MRC	RECORDED	BC	90.5	V	ABTEH	1	0	0	0	23	0	33	132.95	---
			113003040	MRC	ADD	BC	90.4	V	TAMRI	349	0	304	0	23	26.2	37	50.1	---
			105097370	MRC	RECORDED	BC	90.4	V	SMARA	138	0	0	0	23	184.2	37	50.09	---
			107105358	MRC	ADD	BC	90.4	V	AOUINET TORKOZ	169	0	3	0	23	67	37	48.53	---
			107105339	MRC	ADD	BC	90.4	V	ANEZI	280	0	56	0	23	45.3	37	44.94	---
90.5	144.95	144.95	119033078	MRC	RECORDED	BC	90.5	V	ABTEH	1	0	0	0	23	0	45	144.95	---
			107107152	MRC	ADD	BC	90.5	V	TIGLIT	129	0	23	0	23	59.8	37	52.79	---
			116215620	E	RECORDED	BC	90.5	V	ANTIGUA	261	0	150	0	23	283	37	52.15	---
			107106267	MRC	ADD	BC	90.5	V	LAAYOUNE	191	0	0	0	23	244.6	37	47.28	---
			107105827	MRC	ADD	BC	90.6	V	EL AIOUN DU DRAA	101	0	48	0	23	48.9	25	46.03	---
90.6	132.95	132.95	119033078	MRC	RECORDED	BC	90.5	V	ABTEH	1	0	0	0	23	0	33	132.95	---
			107105827	MRC	ADD	BC	90.6	V	EL AIOUN DU DRAA	101	0	48	0	23	48.9	37	58.03	---
			107106094	MRC	ADD	BC	90.6	V	HAOUZA	100	0	0	0	23	153.3	37	52.7	---
			105097423	MRC	RECORDED	BC	90.6	V	TIZNIT	259	0	82	0	23	39.8	37	48.52	---
			118092354	MRC	RECORDED	BC	90.6	V	Imin-Tlit	412	0	324	0	23	26.1	37	44.55	---
90.7	106.95	106.95	119033078	MRC	RECORDED	BC	90.5	V	ABTEH	1	0	0	0	23	0	7	106.95	---
			084008873	E	RECORDED	BC	90.7	M	ARRECIFE LANZAROTE	242	0	183	0	23	300.8	37	55.79	---
			107107248	MRC	ADD	BC	90.7	V	ZAG	208	0	0	0	23	85.9	37	46.59	---
			107105827	MRC	ADD	BC	90.6	V	EL AIOUN DU DRAA	101	0	48	0	23	48.9	25	46.03	---
			119107104	MRC	ADD	BC	90.7	V	IDAOUTANANE	363	0	246	0	23	31.4	37	45.82	---
90.8	92.95	92.95	119033078	MRC	RECORDED	BC	90.5	V	ABTEH	1	0	0	0	23	0	-7	92.95	---
			107105226	MRC	ADD	BC	90.8	V	AKHFENIR	63	0	0	0	23	290.5	37	56.29	---
			107106181	MRC	ADD	BC	90.8	V	JDIRIA	125	0	0	0	23	125.3	37	50.91	---
			107105950	MRC	ADD	BC	90.8	V	ESSAOUIRA VILLE	432	0	375	0	23	22.1	37	45.03	---

Non-Assignable requirement, not having any assignable frequency identified.

In the case where there is no assignable frequency identified for an FM requirement due to incompatibilities above the acceptable value of NFS, it is not possible to assign a frequency to the latter.

Requirement with a fixed frequency

Refers to an FM requirement having a frequency already fixed (the combination of assigned frequency 87.7 MHz & station ID “FLEX” is not submitted for that requirement). In that case, the requirement is treated by the software as a GE84 or ST61 Plan entry.

Affected stations/affected

Refers to the FM assignments or requirement with fixed frequency or, if relevant, ST61 assignments, which are identified by the software as receiving a level of interference from the proposed requirement at a specific frequency ≥ 30 dB(μV/m).

Interfering stations/interferers

Refers to FM assignments or requirements with fixed frequency or, if relevant, ST61 assignments which are identified by the software as generating a level of interference to the proposed requirement at a specific frequency ≥ 30 dB(μV/m).