

Radiocommunication Bureau (BR)

# **Documentation on GE06Calc**

**User Manual** 



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# 1 General Introduction

**GE06Calc** is a PC based application designed to assist administrations in simulating their calculations related to the GE06 Digital Plan for sound and television broadcasting services.

**GE06Calc** tool is designed to be applied for:

- 1) Unofficial conformity examination;
- 2) Viewing compatibility analysis results.

To be able to examine notices subject to unofficial conformity examination for GE06D, **please first install the BR IFIC (Terrestrial) DVD applications and database on your PC**. Conformity examinations will be performed considering the GE06 Plans and MIFR data on the BRIFIC DVD.

From GE06Calc release version 1.5.4.3, the BRIFIC installation is no longer necessary to display the results of the compatibility analysis.

The program is available in English, French, Russian, Arabic and Spanish, as translation resources permit.

Please note that you will be automatically prompted to download any available updates.

# 2 GE06Calc features

# 2.1 Unofficial Conformity examination

*GE06Calc* is intended to be an easy-to-use tool for administrations to unofficially examine the conformity of notices with respect to the GE06 Plan before sending them to the BR.

The application reads electronic notice files and performs <u>unofficial conformity examinations</u> with respect to the GE06 Plan, for notices to be examined for conformity under Article 4 or Article 5 of the GE-06 Agreement.

Conformity examinations will be performed considering the GE06 Plan and relevant MIFR data on the BR IFIC DVD.

<u>Important</u>: The BR IFIC database must be installed before starting *GE06Calc*. The installation procedure is described at:

https://www.itu.int/en/ITU-R/terrestrial/broadcast/GE06Calc/Docs/Using%20BRIFIC%20with%20GE06Calc.pdf

# 2.2 Display Compatibility Analysis Results

The *GE06Calc* application reads the compatibility analysis database file obtained from the *GE06D Compatibility Analyses* jobs available under <u>https://www.itu.int/ITU-R/eTerrestrial/ECalculations</u> (eBroadcasting web application). The compatibility analysis can involve notices (additions, modifications and suppressions) from one or several administrations, which are then "applied" to a snapshot of the current status of the GE06 Plan. (A compatibility analysis is performed on a subset of frequency ranges, either within Band III or within Bands IV and V, depending on input data provided by administrations).

The results of a compatibility analysis are stored in an MS Access database file (MDB format) together with the input data for the calculation, including all the relevant GE06D entries and modifications in process (within a 1000 km boundary) in the relevant frequency band(s).

The GE06Calc application has been enhanced to consider the specificities of the 3 different types of GE06D compatibility:

еТоо	ols: Calc	ulations on-demand
eTools Disclaimer	eTools Docum	nentations
The processing system is cu	rrently ONLINE (2	28 processes available)
Please select the calculation GE06	type	GE06D Art 4 Plan Modification
OLUU		GE06D Art 4 Plan Modification
New Calculation	6	GE06D Compatibility Analyses GE06D ASMG Compatibility Analyses

The general *GE06D Compatibility analysis*, for all the countries which are party to the GE06-Agreement, can examine all the requirements in the GE06 planned bands (i.e. 174-230 MHz and 470-862 MHz).

The **ASMG** and **ATU** compatibility analyses, considering the technical criteria defined by the regional groups for coordinating the necessary modifications to the GE06 Digital Plan, are only available in the band 470-694 MHz. Those examinations can accept flexible channels. The

concept of flexible channel is described below (see page 20).

# **3** Description of the GE06Calc functionalities

### 3.1 Main Menu

• *File Menu Item*: the user can select 2 possible options:



- "Open notice file..." to upload a notice file to be submitted to the unofficial conformity examination in the GE06 Frequency Bands.
  - "Open compatibility analysis results file...." for the selection of the compatibility analysis results MS Access mdb previously downloaded from *eTools*.
- The application keeps track of the databases or notice files previously opened.
- **Tools Menu Item**: The user can select to run the conformity examination from this menu item
- **Preferences Menu Item**: The user can adapt the software regarding various options (language colors display formats)
- Help Menu Item:
  - Table of Contents shows the documentation.
  - About GE06 Calc shows the version of the software. It should correspond to the version announced on the web at

https://www.itu.int/en/ITU-R/terrestrial/broadcast/Pages/Services.aspx

*Release Notes* keeps you informed on the reasons for a new release (new enhancements, bug fixes etc...)

#### 3.2 How to run the unofficial conformity examination

### 3.2.1 Get started

#### The data is loaded in 3 steps:

und in an electronic notice file
Please validate the notice file oct, TerRaNV, TerRaNotices or

**Step 1**: Please select the notice file to be examined. The notice file should contain notices to be examined for conformity under either Article 4 or Article 5 of the GE-06 Agreement, but not both at the same time. There is no such limitation when sending the notice file to the BR. The notice(s) to be examined have to be previously validated using *TerRaNotices* (available from the BR IFIC DVD) or the online validation available at https://www.itu.int/ITU-R/eTerrestrial

Conformity Examination (Step 2 o	of 3) - Review Notices in File
Notice File Contents Summary	Group 1 Group 2 Group 3
Notice file: C:\Users\degert\Downl	loads\RUS_Part 3 of 2905.txt
Number of notices in notice file	: 6
Number of groups of related not	tices in notice file: 3
Click Next for unofficial conform	nity examination results under Art 5 of the GE06 regional agreement

**Step 2**: The notice file is read and the content is displayed and linked notices are grouped. In step 2 of the conformity examination, please review the contents of the notice file, as parsed by the tool. In particular, please check that related notices have been grouped together as intended. At this stage,

only notices contained in the notice file are shown. The user interface has a limitation of 100 related groups of notices per notice file. Please note that there is no such limitation for notice files sent to the BR.

Conformity Examination (Step 1 of 3) - Select Notice File		
This tool performs an unofficial conformity examination of notices foun	d in an electronic no	tice file
Note: This tool supports neither invalid notices nor resubmissions. Ple sing tools such as GE06 Digital Broadcasting Notice Processing Too imilar software)	ase validate the not I, TerRaNV, TerRaN	ice file otices or
Lotice file: C:Users)deger(Downloads)RUS_With_Errors.bd		
Could not determine the required type of examination		
	Next >>	Cancel

If there are any problems in parsing the file, the problem report is shown and the "Next" button is disabled. If the problem is easy to correct, you can click on the "<u>Notice file:</u>" link to open your default editor for text (\*.txt) files and make the correction. Clicking on the "<u>Notice file:</u>" link will also re-enable the "Next" button. Otherwise, please select a different notice file

**Step 3:** Click next. The conformity examination is run as per Section II of Annex 4 of GE-06 Agreement and the results are displayed. There may be a slight delay since the tool needs to prepare auxiliary databases.

# 3.2.2 Conformity Examination results



**Step 1**: A summary is displayed to explain the results of the examination for the notices organized in groups. The summary screen has statistics on different reasons for notices not being in conformity. Please note that certain groups of related notices may have several simultaneous reasons for not being in conformity. In cases where the corresponding plan entry was found, the related notices/entries are displayed as two lists, one for the

proposed implementation, and the other for the Plan entry. If applicable, the implementation list will show other already published notices and/or recorded Master International Frequency Register (MIFR) entries (for Article 5 conformity) or other related converted assignments recorded in the Plan (for Article 4 conformity).



**Step 2**: If the envelope is calculated, the field strength values of the plan entry and of the implementation are calculated at each point of the broadcasting cut-off field strength contour, and at all the points on geometric contours (60, 100, 200, 300, 500, 750 and 1 000 km) lying within the cut-off field strength contour and reaching outside the administration boundary. The points where the field strength is exceeded are displayed in red on the map.

The user can decide which information should be displayed on the map in the "Legend" tabulation in the right-hand part of the screen.

### 3.3 Tools dedicated to the compatibility analysis

### 3.3.1 Get started

Prepare your notice file that contains one or more electronic notices and upload<u>it on e</u>Tools (eBroadcasting web application). Once the calculation is finished, download the resulting zipped MS Access database file and save it on your computer.

Upon selecting the unzipped MS Access database file through "open Compatibility analysis results file..." from the menu shown in section 3.1 above, the Compatibility Status Selection Criteria screen is shown, from where many other functionalities become available. Most of the features are available from context menus (right-click) in tables and from the graphical display.

The selection is performed against the information present in the MDB file.

# 3.3.2 GE06Calc Compatibility Status: features

ocuren	
Admi HO	Administration
Туре	of Analy 🕤
O	igital-to-[ ←
) D	igital-to-/ → 💿
A (1)	nalogue- 🕁 🕴
Fied	HE(470-698 MHz)
۵ U	
O U Marg	in (470 000 Will2)
<ul> <li>U</li> <li>Marg</li> <li>D</li> </ul>	in
O U Marg O D	in o not set a filter on Margin aximum Margin (dB)

The arrows represent the direction (to  $\rightarrow$ , from  $\overleftarrow{}$ , to & from  $\overleftarrow{}$ , internal incompatibilities  $\overleftarrow{}$ ). In the example above we are selecting all the DTT frequency assignments affecting the DTT stations of UZB. Only DTT entries are displayed if the type of analysis selected is Digital-to-Digital.

If Other Primary Services, recorded or published in Part A of the List (GE06L), for the neighbouring countries, are identified as potential interferers, they are displayed if the user selects "Digital-to-Other-Services" or "Other Services-to-Digital".

The compatibility analysis is performed on a subset of frequency ranges, either VHF or UHF frequency bands.

Once the selection is confirmed, a list of affected and interfering frequency assignments/requirements is shown to the user in accordance with the selection criteria.

When flexible channels (See Section 4 below) are submitted, the columns affected and/or interfering channel can show more than one channel.

1	d Aff A	Aff G	Aff Not.	Aff AdmRefld	Aff Site/Allot	Aff SFN I	Aff	Aff Ac Ch/bl	Aff Ch/block	Int A	Int G	Int Not.	Int AdmRefld	Int Site/Allot	Int SFN Id	Int Int Ac	Int Ch/	8BH (dBW)	8BV Distanc	(k CNFS (dB(u	Margin (dB) Relation
1	KWT	KWT	GT1	KWTDVB131	MUTLAA			40	40	KWT	KWT	GT1	KWTDVB122	FAILAKA2		40	40	27	5	1.8 82.1	26.47 Interference
1	2 KWT	KWT	GT1	KWTDVB116	JULAIA			22	22	KWT	KWT	GT1	KWTDVB112	SUBIYAH		22	22	27	8	5.2 77.9	24.55 Interference
	KWT	KWT	GT1	KWTDVB141	RUWAYSAT			24	24	KWT	KWT	DT1	KWT000051	DIBDIBAH		24	24	30		5.4 77.4	23.75 Interference
	KWT	KWT	GT1	KWTDVB150	SUBIYAH			36	36	KWT	KWT	GT1	KWTDVB117	JULAIA		36	36	27	8	1.8 77.7	22.54 Interference
5	KWT	KWT	GT1	KWTDVB111	MUTLAA1	KWTDVB		46	46	KWT	KWT	DT1	KWT000028	SALMI		46	46	40	5	1.3 76.9	20.62 Interference
6	KWT	KWT	GT1	KWTDVB131	MUTLAA			40	40	KWT	KWT	GT1	KWTDVB159	BUBIYAN1		40	40	27		69 76	20.4 Interference
1	KWT	KWT	GT1	KWTDVB159	BUBIYAN1			40	40	KWT	KWT	GT1	KWTDVB122	FAILAKA2		40	40	27	1	5.5 75.7	20.11 Interference
8	KWT	KWT	GT1	KWTDVB113	SUBIYAH1			28	28	IRN	IRN	DT1	IRN_D84014	ABADAN		28	28	42		83 74.2	20.02 Interference
5	KWT	KWT	GT1	KWTDVB132	MUTLAA			48	48	KWT	KWT	GT1	KWTDVB135	MAGWA1		48	48	30	4	3.4 76	19.57 Interference
10	KWT	KWT	GT1	KWTDVB112	SUBIYAH			22	22	KWT	KWT	GT1	KWTDVB116	JULAIA		22	22	30	8	1.6 72.3	18.94 Interference
11	KWT	KWT	GT1	KWTDVB103	MUTLAA1	KWTDVB		34	34	KWT	KWT	DT1	KWT000019	RUWAYSAT	r	34	34	30	Ę	2 73.4	18.53 Interference
12	KWT	KWT	GT1	KWTDVB159	BUBIYAN1			40	40	IRN	IRN	DT1	IRN_D84108	KUH MOND		40	40	42	31	5.7 74.1	18.49 Interference
13	KWT	KWT	GT1	KWTDVB157	AL ZOOR			39	39	IRQ	IRQ	GT1	BR1_IRQDA	ALFAO		39	39	25		46 73.8	18.31 Interference
14	KWT	KWT	GT1	KWTDVB149	AFWAH	KWTDVB		24	24	KWT	KWT	GT1	KWTDVB141	RUWAYSAT	r	24	24	30	4	3.7 71.6	18.01 Interference

As previously mentioned, most of the features are available from context menus (right-click):

🐏 Se	lected Comp	atibility	y Status													
	Id Aff A	Aff G	Aff Not.	Aff AdmRefld	Aff Site/Allot	Aff SFN I	Aff	Aff Ac Ch/bl	Aff Ch/block	Int A	Int G	Int Not.	Int AdmRefld	Int Site/Allot	Int SFN Id	Int Int Ac
Þ	1 KWT	KWT	GT1	KWTDVB131	MUTLAA			40	40	KWT	KWT	GT1	KWTDVB122	FAILAKA2		40
	2 KWT	KWT	GT1	KWTDVB116	JULAIA			22	22	KWT	KWT	GT1	KWTDVB112	SUBIYAH		22
	3 KWT	KWT	GT1	KWTDVB141	RUWAYSAT			2 Affected A	cceptable Ch	annel/l	reque	ncy Block	KWT000051	DIBDIBAH		24
	4 KWT	KWT	GT1	KWTDVB150	SUBIYAH			36	36	KWT	KWT	GT1	KWTDVB117	JULAIA		36
	5 KWT	KWT	GT1	KWTDVB111	MUTLAA1	KWTDVB		46	46	KWT	KWT	DT1	KWT000028	SALMI		46
	6 KWT	KWT	GT1	KWTDVB131	MUTLAA			40	40	KWT	KWT	GT1	KWTDVB159	BUBIYAN1		40
	7 KWT	KWT	GT1	KWTDVB159	BUBIYAN1			40	40	KWT	KWT	GT1	KWTDVB122	FAILAKA2		40
	8 KWT	KWT	GT1	KWTDVB113	SUBIYAH1			28	28	IRN	IRN	DT1	IRN_D84014	ABADAN		28
	9 KWT	KWT	GT1	KWTDVB132	MUTLAA			48	48	KWT	KWT	GT1	KWTDVB135	MAGWA1		48
	10 KWT	KWT	GT1	KWTDVB112	SUBIYAH			22	22	KWT	KWT	GT1	KWTDVB116	JULAIA		22
	11 KWT	KWT	GT1	KWTDVB103	MUTLAA1	KWTDVB		34	34	KWT	KWT	DT1	KWT000019	RUWAYSAT		34
	12 KWT	KWT	GT1	KWTDVB159	BUBIYAN1			40	40	IRN	IRN	DT1	IRN D84108	KUH MOND		40
	13 KWT	KWT	GT1	KWTDVB157	AL ZOOR			39	39	IRQ	IRQ	GT1	BR1 IRQDA	ALFAO		39
	14 KWT	KWT	GT1	KWTDVB149	AFWAH	KWTDVB		24	24	KWT	KWT	GT1	KWTDVB141	RUWAYSAT		24



Additional features: a left-mouse click on the columns opens a dialog for the user to select the column preferences (sort order and displayed columns). If the user wants the application to "remember" those changes, he/she should click on the button "set as default".

# 3.3.2.1 How to use the Coverage Analysis screen



The Coverage Analysis screen displays the number of coverages at a given point in a geographic area, that is, the sets of requirements whose service area covers the point.

The intensity of the color in a given point corresponds to the number of coverages, i.e. a darker color means more coverages. For the legend to be correct, the selected maximum must be equal to or greater than the maximum number of actual coverages, which requires some trials on the part of the user.

It is possible to easily compare acceptable channels from the input data and available/assigned channels from the analysis results by clicking on the corresponding radio button. More details on the actual coverages may be obtained

by right-clicking on a given point. A pop-up list appears, showing the number of coverages at the point, as well as the following information for each coverage:

- **Adm**: Administration identifier.
- *Adm Ref Id*: unique identifier from the input data.
- **Acceptable or Available Channels or Assigned Channel**: The acceptable channels from input data or the available channel or assigned channel from the analysis/synthesis results (see definition further down).

### 3.3.2.2 How to use the Service/Coverage Areas screen



The Service/Coverage Area screen shows the coverage/service area for individual OPS assignments, present in the database and showing incompatibilities with the DTT requirements submitted to the compatibility analysis, with filtering by TV channel



Details of the requirement or compatibility analysis details can be invoked from the context menu either from the summary list or by right-clicking on the map.

#### **3.3.2.3** How to use the channel distribution statistics screen



Step 1: A selection criteria screen is shown, from where the statistics are calculated:



The statistics are available for a specific administration, selected in the dropdown box. The list of available administrations is based on the requirements submitted to

the compatibility analysis in *eTools*. If the user submits only one file of notices representing her/his country requirements, the selection screen will show only one administration.

**The Maximum Acceptable Margin, also called limiting margin:** An allowance has been made for interference in the preparation of the Plan. For this purpose, a concept of limiting margin has been introduced. The term "limiting margin" is to be interpreted in the sense

- in the case of wanted digital terrestrial broadcasting, the limiting value of the margin has been taken to be 1.25 dB
- in the case of wanted other primary terrestrial assignments, the limiting value of the margin has been taken to 1.0 dB

A possible relaxation can be considered for the limiting margin. This is described in the document

available at:

## https://www.itu.int/en/ITU-R/terrestrial/broadcast/ASMG/Documents/info/INFO-5-E.pdf

Such a relaxation can be captured (in the example above a limiting margin of 4 dB was captured), which will have an impact on the statistics. It is important to note that all the incompatibilities above 1.25 dB are shown in the detailed results. Selecting a higher value of limiting margin/maximum acceptable margin only has an impact on the "Channel Distribution statistics" where a channel which was not assignable for a 1.25 dB limiting margin may become assignable if the level of interference considered is higher (i.e. the limiting margin is higher).

Filtering option having an impact on the statistics:

- Selecting a high margin, disregarding self-incompatibilities between stations within an administration, ignoring incompatibilities must be done with great care.
- Selecting a limiting margin above 4 dB is not advisable as it represents a high level of interference.
- Disregarding interference received is appropriate under specific terrain conditions (e.g. if there are natural obstacles at the border between two countries).
- Self-incompatibilities should be resolved before bringing a frequency assignment into operation.
- Ignoring requirements with flexible channels is possible if the box "Show assignable channels" if ignoring incompatibilities between requirements where one or both has/have a range of available frequencies" is selected.

The list of possible filters depends on the decision of the regional frequency coordination group. For the *ASMG compatibility analysis*, the tool is taking into account the recommendations and technical criteria agreed by the frequency coordination meeting available at: https://www.itu.int/en/ITU-R/terrestrial/broadcast/ASMG/Documents/info/INFO-9.pdf

For the ATU compatibility analysis (Sub-Saharan Africa), the GEO6Calc software has been modified (from version 1.5.4.5) to apply the maximum margin captured in the statistics to the interference received from an administration outside the Sub-Saharan African countries up to the maximum acceptable margin captured (e.g. if the maximum acceptable margin is 4 dB, any interfering margin of 4 dB or less received from any administration outside the Sub-Saharan African countries is disregarded for the definition of "assignable channel"). Please note that an interference generated to an administration outside the Sub-Saharan African countries is disregarded margin.

*Step 2*: When the user clicks on the *Refresh button*, the channel distribution statistics are shown:

ninistration K	WT 🔻	Refresh			
Show assign	able channels or t	freq. blocks if the maximum accepta	ble margin (dB) is: 4		
Show assign	able channels or t	freq. blocks if ignoring incompatibilit	ies between requirements where on	e or both has/have a range of availa	ible frequen
🔽 lanara colf is	compatibilitios	Do not consider interference	to the wanted requirement		
ynute seit it	compandances	Consider interierence	rio une wanteu requirement		
Ignore interf	erence received u	p to the max acceptable margin from	m adms outside the coordination gro	up (no limit if from within the group)	
Ignore interfi annel Distributio	erence received u n Statistics	p to the max.acceptable margin fror	m adms outside the coordination gro	up (no limit if from within the group)	
Ignore interf	erence received u n Statistics Submitted	p to the max acceptable margin from No available channel or frequency block	n adms outside the coordination gro No assignable channel or frequency block	up (no limit if from within the group) Having an assignable channel or a frequency	
Ignore interf annel Distributio Assignments	erence received u n Statistics Submitted <u>59</u>	p to the max acceptable margin from No available channel or frequency block	n adms outside the coordination gro No assignable channel or frequency block <u>13</u>	up (no limit if from within the group) Having an assignable channel or a frequency <u>46</u>	
Ignore interf annel Distribution Assignments Allotments	erence received u n Statistics Submitted <u>59</u> 0	p to the max acceptable margin from No available channel or frequency block <u>5</u> 0	n adms outside the coordination gro No assignable channel or frequency block <u>13</u> 0	up (no limit if from within the group) Having an assignable channel or a frequency 46 0	

In this example,

• 59 requirements have been submitted

• 5 requirements do not have any available channel (see column "no available channel or frequency block"). This is because these channels are already assigned to the same site and/or to the neighboring countries that are not part of this planning exercise and the level of interference

generated to the stations of those countries outside the planning area is higher than the 1.25 dB limiting margin considered for the development of the Plan or to 1dB limiting margin if some Other Primary Services of neighboring countries are involved.

The 5 requirements above are also considered in the column identifying the total number of requirements having "No assignable channel or frequency block". The additional 8 requirements are those having incompatibilities generating levels of margin above the maximum acceptable margin captured in the previous step.

The requirements in the column "Having an assignable channel or frequency block" are generating (or receiving) levels of interference below the limiting/maximum acceptable margin.

Clicking on the number of assignments/allotments in one of the columns will take the user to the detailed results.

#### 3.3.3 **General Analysis Results (GAR)**

11 ALG ALG GT1

12 ALG ALG GT1

#### How to get to the "General Analysis Results" (GAR) 3.3.3.1

ITER 27 BO BOUZIZI

ITER 27 FIL DJ FILFILA

Show General Analysis Results can be invoked from the context menu, no matter which • selection has been made in the "View" menu.

ITER 27 FIL

ITER 27 BO

a) From "Compatibility Analysis" – Right – mouse click on a table row.

Ħ	[C:\	\Users\d	eger	t\Dow	nloads\Ite	rationResults_W	/ithCoord.mdb] GE06 C	alc - [	Selected	I Compatibility	/ Status]					
6	🦻 Fi	ile Edit	V	iew	Tools Pr	references Wir	ndow Help									
		ld A	ff A	Aff G	i Aff Not.	Aff AdmRefld	Aff Site/Allot Name	Aff S	FN Id	Aff Allot Ad	Aff Ac Ch/bl	Aff Ch/block	Int A	Int G	Int Not.	Int AdmRefld
►		1 A	LG	ALG	GT1	ITER_27_MA	MAHOUNA				21	21	ALG	ALG	GT1	ITER_27_BO
		2 A	LG	ALG	GT1	ITER 27 MA	MAHOUNA		1		21	21	ALG	ALG	GT1	ITER_27_FIL
		3 A	LG	AL	Show i	nput data detai	Is for affected				21	21	ALG	ALG	GT1	ITER_27_KE
		4 A	LG	AL	Show o	general analysis	results for affected				21	21	ALG	ALG	GT1	ITER_27_MA
		5 A	LG	AL	Show i	nput data detai	ls for interferer				21	21	ALG	ALG	GT1	ITER_27_MA
		6 A	LG	AL	Show	neneral analysis	results for interferer		F2001		21	21	ALG	ALG	GT1	ITER_27_ZE
		7 A	LG	AL	311011	general analysis	results for interferen				21	21	ALG	ALG	GT1	ITER_27_ZE
		8 A	LG	AL	Copy v	alue to clipboa	rd				21	21	ALG	ALG	DT1	DZDT10880
		9 A	LG	AL	Find						21	21	ALG	ALG	DT1	DZDT10194
		10 A	G	ALG.	GT1	ITER 27 7E	ZECCAR	_			21	21	ALG.	ALG.	DT1	DZDT10185

b) From "Coverage Analysis" – Right- mouse click on the map where coverages are displayed, then, position the mouse on an entry in the list of stations covering that area:

21

21

21

21

ALG ALG GT1

ALG ALG GT1





d) From Channel Distribution Statistics:

The user can double-click on a row or click on the right mouse button.

# **3.3.3.2** Interpretation of the compatibility analysis results displayed in the "General Analysis Results" (GAR)

• When the user clicks on the hyperlinks representing statistics on the number of assignments or allotments, based on the selection criteria, the details of those are shown

dministration	(WT 👻	Refresh									
V Show assig	nable channels or	freq. blocks if the maximum accepta	ble margin (dB) is: 4								
Show assig	nable channels or	freg, blocks if ignoring incompatibilit	ies between requirements where on	e or both has/have a range of a	available freque						
				o boarnashave a range or e	aranabie ireque						
Ignore self i	incompatibilities	Do not consider interference	to the wanted requirement								
☑ Ignore self incompatibilities ☑ Do not consider interference to the wanted requirement											
Ignore inter	ference received u	p to the max.acceptable margin fror	n adms outside the coordination gro	up (no limit if from within the gr	oup)						
Ignore inter	ference received upon Statistics	p to the max.acceptable margin from	n adms outside the coordination gro	up (no limit if from within the gr	oup)						
Ignore inter hannel Distributio	ference received u on Statistics Submitted	p to the max.acceptable margin from No available channel or frequency block	n adms outside the coordination gro No assignable channel or frequency block	up (no limit if from within the gro Having an assignable channel or a frequency	oup)						
Ignore inter Channel Distribution	ference received u on Statistics Submitted <u>59</u>	p to the max acceptable margin from No available channel or frequency block	n adms outside the coordination gro No assignable channel or frequency block <u>13</u>	up (no limit if from within the gru Having an assignable channel or a frequency <u>46</u>	oup)						
Ignore inter Channel Distribution Assignments Allotments	ference received u on Statistics Submitted <u>59</u> 0	p to the max.acceptable margin from No available channel or frequency block <u>5</u> 0	n adms outside the coordination gro No assignable channel or frequency block 13 0	up (no limit if from within the gr Having an assignable channel or a frequency <u>46</u> 0	oup)						

Double click on the row to get the results of the calculations for a specific requirement (i.e. UM AL AISH on channel 38, highlighted below)

[C:\	Users\degert	\Download	ds\IterationResu	ults_WithC	oord.mdb] GE06 Calc	- [Channel Dis	tribution Deta	ails - Digital as	signments with
🔮 Fil	le Edit Vi	ew Tool	s Preferences	Window	v Help				
UHFC	Channel Distrib	ution VHF	Channel Distribu	tion					
	No. Adm	Geo Are	Adm Ref Id	Not.Typ	Site/Allot Name	SFN Id	Ch/block	Avail. Ch/bl	Assignable C
	1 KWT	KWT	KWTDVB148	GT1	ABDALIA		37	37	
	2 KWT	KWT	KWTDVB155	GT1	AL ZOOR		26	26	
	3 KWT	KWT	KWTDVB123	GT1	FAILAKA1	KWTDVBS	46		
	4 KWT	KWT	KWTDVB136	GT1	MAGWA1		27	27	
	5 KWT	KWT	KWTDVB127	GT1	MOI1		33		
	6 KWT	KWT	KWTDVB109	GT1	MOI1	KWTDVBS	46		
	7 KWT	KWT	KWTDVB129	GT1	MUTLAA		26	26	
	8 KWT	KWT	KWTDVB111	GT1	MUTLAA1	KWTDVBS	46		
	9 KWT	KWT	KWTDVB139	GT1	SALMI 1		35	35	
	10 KWT	KWT	KWTDVB110	GT1	SOUTH SUBAHIAH	KWTDVBS	46		
•	11 KWT	KWT	KWTDVB153	GT1	UM AL AISH		38	38	
	12 KWT	KWT	KWTDVB152	GT1	UM AL AISH		26	26	
	13 KWT	KWT	KWTDVB151	GT1	UM AL AISH		27	27	

• The General Analysis Results for this assignment Will appear as shown below:



The digital requirement under consideration can be identified (service area flashes) by clicking on the button "identify current requirement service area" (in blue on the picture).

# **3.3.3.3** Analysis of the results

In most cases, the General Analysis Results contain "Digital Interferers" and "Digital Affected" tabulations, where:

- "Digital Interferers" contains the list of digital assignments, in process or recorded in the GE06D Plan, and the digital requirements which are affecting the digital requirement under consideration (incoming interference margin > 1.25 dB);
- "Digital Affected" contains the list of digital assignments, in process or recorded in the GE06D Plan, and the digital requirements which are affected by the digital requirement under consideration (outgoing interference margin > 1.25 dB).

One or both tabs can be missing if the digital requirement under consideration does not suffer or/and cause any interference from/to digital assignments/requirements (calculated margins below 1.25 dB) on that specific channel.

In the case where digital interferers and/or digital affected are present, the analysis starts with the column "Relation". Three relation types are possible, namely:

- "Overlap" means that the service/coverage areas of two transmitters are overlapping. The selected channels therefore are not suitable for the digital requirement under consideration. However, in some cases, due to terrain shielding, this can be possible after more detailed calculations involving terrain profiles.
- "Tx inside" this case is worse than "Overlap". The transmitter site is located inside the service/coverage area of the interfering/affected assignment/requirement.
- "Interference". In this case only, the margin is calculated and reflected in the column "Margin".

There may be 2 cases:

**Case 1**: Calculated margins in both directions (incoming and outgoing interference) do not exceed the maximum acceptable margin selected by the user in the "Channel Distribution Statistics". The channel is compatible and it can be assigned to the digital requirement under consideration.

**Case 2**: The calculated margin in one or both directions exceeds the maximum acceptable margin. Several situations are possible:

- a) Self-Interference: The interference involves the digital requirement under consideration and digital assignment/requirement of the same administration. It is the responsibility of the administration to decide on this situation.
- b) The digital requirement under consideration is affecting assignment/requirement from a neighboring administration. In that case, a modification to the technical characteristics may help (reduction of maximum ERP, revision of the transmitting antenna pattern etc.) to

reduce the interference in the direction of the affected assignment/requirement of another administration. Please note that such a modification cannot be made directly in **GEO6Calc**; the notice containing the revised notice should first be submitted to **eTools** for a new compatibility analysis. If the results are satisfactory, the notice should be retained in the file to be submitted to the BR for its recording into the Plan. If not, the parameters can be reviewed, and the calculations should re-run until the results are satisfactory.

c) The digital requirement under consideration is receiving interference from recorded assignment(s) or requirement(s) of another administration. The administration seeking for this specific channel can accept this higher level of incoming interference if the terrain profile between both sites is preventing interference.

More detailed calculations, using external software packages considering digital terrain profiles, may be performed. Furthermore, in all the above situations, except a), bilateral/multilateral coordination may be needed to obtain the best possible results.

- "Other Services Interferers", which contains the list of Other Primary Services (OPS), in process or recorded in the GE06L List which are affecting the digital requirement under consideration (incoming interference margin > 1.25 dB);
- "Other Services Affected", which contains the list of Other Primary Services (OPS), in process
  or recorded in the GE06L List which are affected by the digital requirement under
  consideration (outgoing interference margin > 1 dB).

Those tabs will not appear if the digital requirement under consideration does not suffer or/and cause any interference from/to Other Primary Services.

When considering the OPS, the goal is to protect them. Consequently, when the proposed requirement produces, on an OPS a neighboring country, an interference margin greater than 1 dB on a specific channel, the channel is identified as "unavailable" to the digital requirement. In other words, the channel cannot be assigned when it is interfering with the Other Primary Services of the neighboring administrations.

On the other hand, interference received from OPS (OPS interferer) as well as internal incompatibilities (OPS to digital and digital to OPS) are not setting the channel as unavailable to the digital requirement.

In the example below, channels 40 and 45 cannot be assigned to the requirement from AZE (see available channels) because it is interfering with the OPS of IRN on channel 40 and RUS on channel 45 (see Other Services affected).



# 3.3.4 Detailed Analysis Results (DAR)

The value indicated in the column "Margin" represents a calculated margin for the most affected point on the edge of the service area. To see calculated margins for all affected points, where the calculated margin value is higher than 1.25 dB, it is necessary to carry out the detailed analysis of the results.

To see the DAR:

In the GAR window, select the assignment/requirement of interest and right-mouse click on it. In the context menu, select the "Detailed Analysis Results" option.



The following window will appear, where the details are indicated. The worst-case point of the service/coverage area of the affected digital requirement under consideration is surrounded in blue.

 DetailedAnalysis

 Requirement under investigation:
 Digital Affected:

 UM ALAISH
 ALJAMO

 Running directory: C:\Users\degert\AppData\Local\Apps\2.0\\8CXJD5BR.1R9\08KDAL61.P3V\ge06.tion\_b7bca5f18417bb9\_0001.0005\_317c308b9f03ae

 command for named approach:
 C:\Users\degert\AppData\Local\Apps\2.0\\8CXJD5BR.1R9\08KDAL61.P3V\ge06.tion\_b7bca5f18417bb9\_0001.0005\_317c308b9f03ae

 id2duhfALJAMO
 Extracting digital requirements from database

 starting req2bin.exe completed in 1.91
 starting req2bin.exe completed in 1.1

 Detailed analysis results file name:
 C:\Users\degert\AppData\Local\Apps\2.0\\8CXJD5BR.1R9\08KDAL61.P3V\ge06.tion\_b7bca5f18417bb9\_0001.0005

 Any potentially interfering requirements are listed
 Any potentially interfering requirements are listed

KWJ	KWTDVB153	UM AL AISH		char	1 3	8 p	rt 33.8	dB						
adn	dentifier	pol	erph	erpv		erp	effht	bear	dist	cnfs	margin	ang	wtplng	wtplat
KWI	KWTDVB153	н	30.0	-99.9 I	)	29.7	14.3	193.4	94.4	57.0	3.89	170.0	47.47	28.94
KWI	KWTDVB153	н	30.0	-99.9 I	)	29.6	13.8	194.0	96.2	58.0	4.50	80.0	47.46	28.93
Kin a	KWIDVDIGG		50.0			20.0	13.1	104.0	2015	57.7	3.02	190.0	47.45	28.93
KWI	KWTDVB153	н	30.0	-99.9 I		29.4	12.3	195.9	98.6	57.2	3.99	200.0	47.42	28.91
KWI	KWTDVB153	H	30.0	-99.9 I	0	29.3	11.5	196.9	97.9	57.0	3.85	210.0	47.41	28.92
KWI	KWTDVB153	H	30.0	-99.9 I	)	29.2	10.7	197.9	97.0	55.8	3.23	220.0	47.39	28.94
KWI	KWTDVB153	н	30.0	-99.9 I	0	29.1	10.0	198.8	96.2	52.0	1.62	230.0	47.38	28.95

### 4 Some definitions:

#### **Acceptable Channel**

Refers to the channel(s) which is/are notified by the administration for a digital requirement.

If the submitted frequency requirement is a flexible channel, the frequency channels already in the GE06D Plan for that transmitter site (identified by the location) are discarded.

#### **Flexible Channel**

In the case where the user wants to analyze the situation of a digital requirement for all the acceptable frequency channels of the UHF frequency band, the requirement should contain the following information:

– for UHF: channel 69, frequency 858 MHz

This option is only valid for the ATU/ASMG compatibility analyses.

The compatibility analysis software will scan the band on a channel-by-channel basis to assess incompatibilities. In this case, the software is calculating the service area of the digital requirement, taking into account the lowest acceptable frequency (i.e. the worst-case scenario).

### Available (Av) Channel

Refers to the channel(s) among the list of Acceptable Channels, which are determined by the planning software to be compatible with other primary services in the GE06L List, hence available for assigning to a digital requirement.

#### Assignable Channel

Refers to the channel(s) among the list of Available Channels, which are determined by the planning software to be compatible with assignments and requirements to digital broadcasting services and other primary services.

In the case where there is no Available Channel identified for a digital requirement due to incompatibilities with assignments to digital and/or other primary services in the List, it is not possible to assign a channel to the digital requirement

### Assigned (As) Channel

Refers to the frequency channel, among the list of Available Channels, which is already assigned to a digital assignment recorded in the Master Register.

# Affected (Aff) Channel

Refers to the channel of the digital or OPS assignments or requirements of the affected administration, which is identified by the compatibility analysis.

# Interfering (Int) Channel

refers to the channel of the interfering digital or OPS assignments or requirements of another administration (the same administration if self-incompatibility is considered), which is identified by the compatibility analysis.

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