

الاتحاد الدولي للاتصالات



الحلقة الدراسية الإقليمية
للاتصالات الراديوية من أجل البلدان العربية

تونس العاصمة، تونس

13-9 ديسمبر 2013

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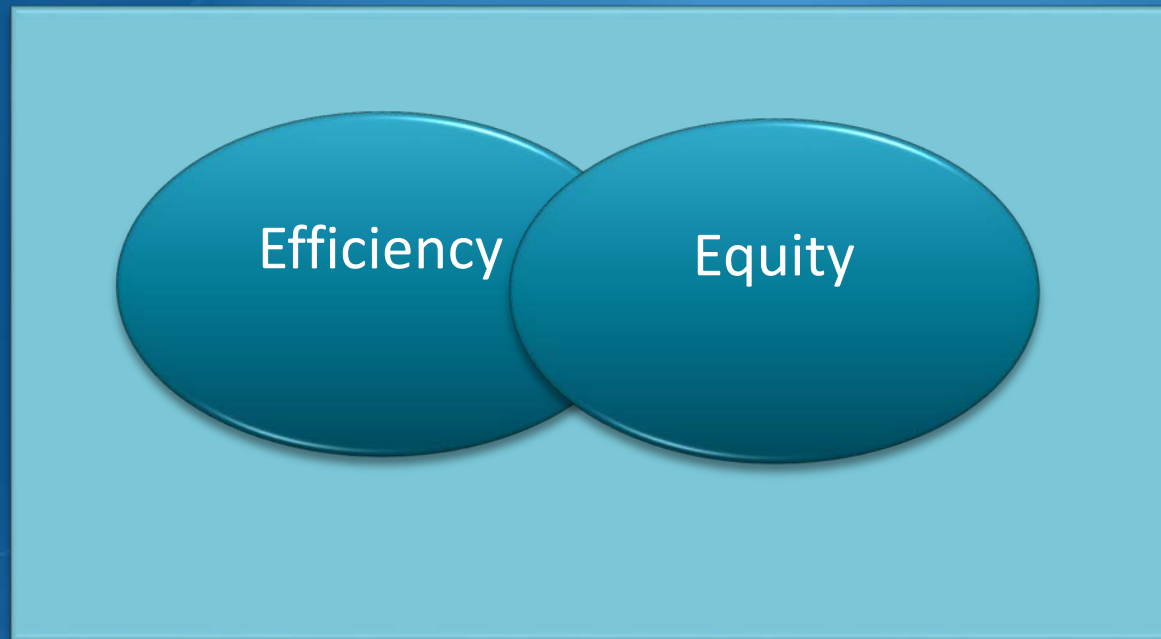


Broadcasting Plans Procedures

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BR
Broadcasting Services Division

BROADCASTING REGIONAL PLANS , other than GE06

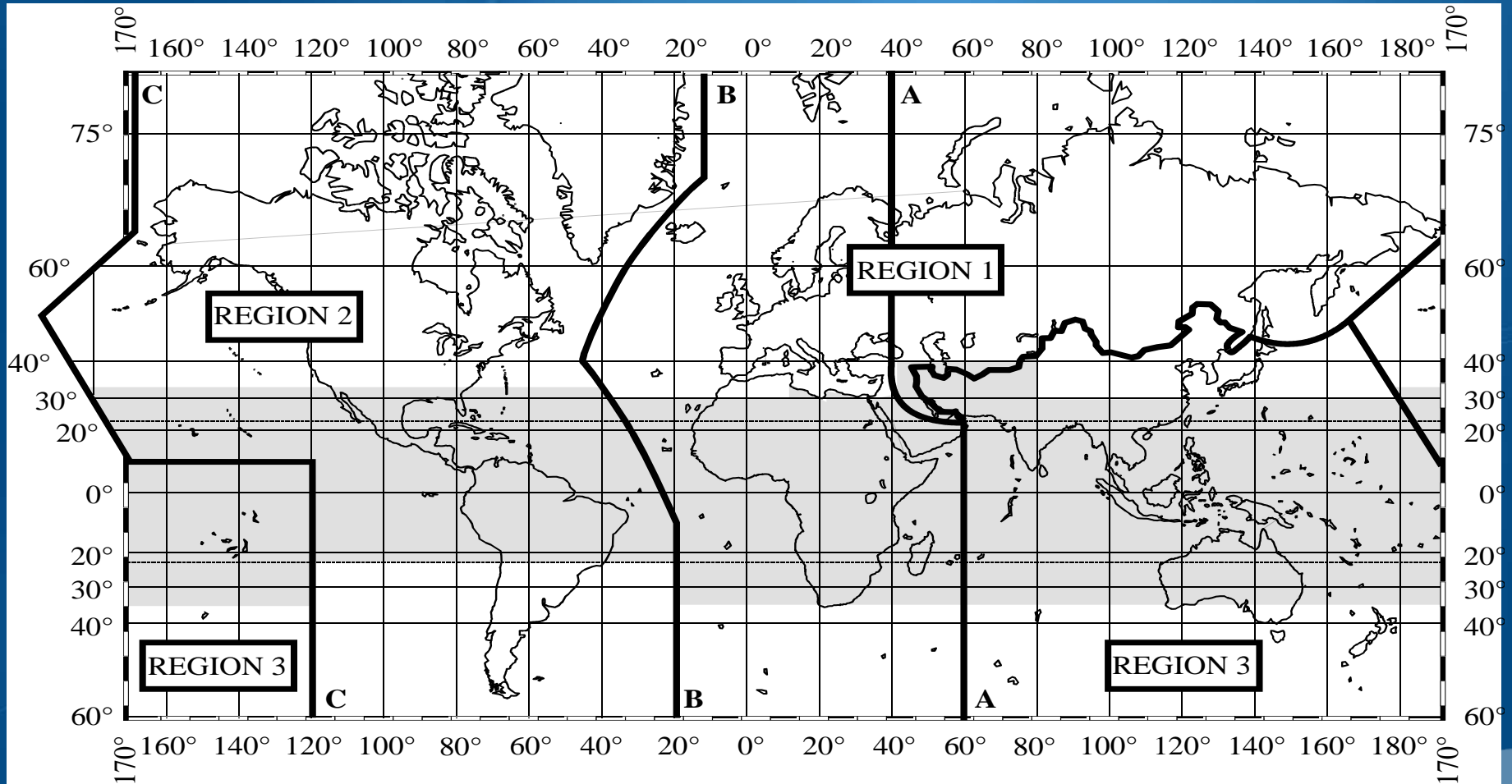
The need for frequency Plans



Development of frequency Plans

- Regional Radiocommunication Conferences
 - First session – adopt technical planning criteria
 - Second session – adopt Agreements containing frequency Plans

ITU Regions



The shaded part represents the Tropical Zones as defined in Nos. 5.16 to 5.20 and 5.21.

Frequency bands for Broadcasting services (\neq HF)

Band	Frequency (kHz/MHz)	BC/BT	Region Geo. zone	Plan
LF	148.5-283.5 kHz	BC	R1	GE75
MF	526.5-1 606.5 kHz	BC	R1 and R3	GE75
	525-1 605	BC	R2	RJ81
	1 605-1 705	BC	R2	RJ88
VHF /UHF	47-68 MHz	BC, BT	EBA	ST61
	47-68	BT	ABA	GE89
	87.5-100	BT	EBA	ST61
	87.5-108	BC	R1*	GE84
	162-170 MHz	BT	MRC	ST61
	(170 _{MRC})174-230	BC , BT	R1-MNG+IRN	GE06
	230-238, 246-254	BT	See RR 5.252	GE89
470-862	BT	R1-MNG+IRN	GE06	

* and part of R3

Modifications to the Plans

- Definition -

- Add a new assignment to the Plan
- Modify an entry of the Plan (recorded assignment)
- Suppress an existing assignment

General procedure

- Notifying ADM submits electronic forms
- BR identifies potential affected administrations
- BR publishes in Part A of a Special Section annexed to a BRIFIC
- BR informs affected administrations
- Affected administrations send comments to the BR and to the notifying ADM
- Coordination process completed, notifying ADM request publication on Part B
- BR publishes in Part B of a Special Section annexed to a BRIFIC
- Modifications recorded in the Plan

Identify affected administrations

- Depends on Plans:
 - Distance to nearest boundary
 - Potential interference to assignments in the Plan

Comment period

- Specified deadlines:
 - 100 days (GE84)
 - 16 weeks (GE75)
 - 10 weeks (ST61)
- No reaction from affected:
 - Deemed to AGREE to the modifications

“Quick” modification procedure

- No agreement required if:
 - Less interference (e.g. lower ERP/site)
 - Distance to border < coordination limits
 - Field strengths at border < coordination limits

Part B publication

- Not automatic
- Notifying ADM **must request** for publication in Part B

ST61 Plan- Quick view



➤ Entry into force : 1 September 1962

➤ Frequency bands:

● 41-68 MHz (Sound and TV)

● 87.5-100 MHz (TV)

● 162-174 MHz (TV)

Exclusive bands

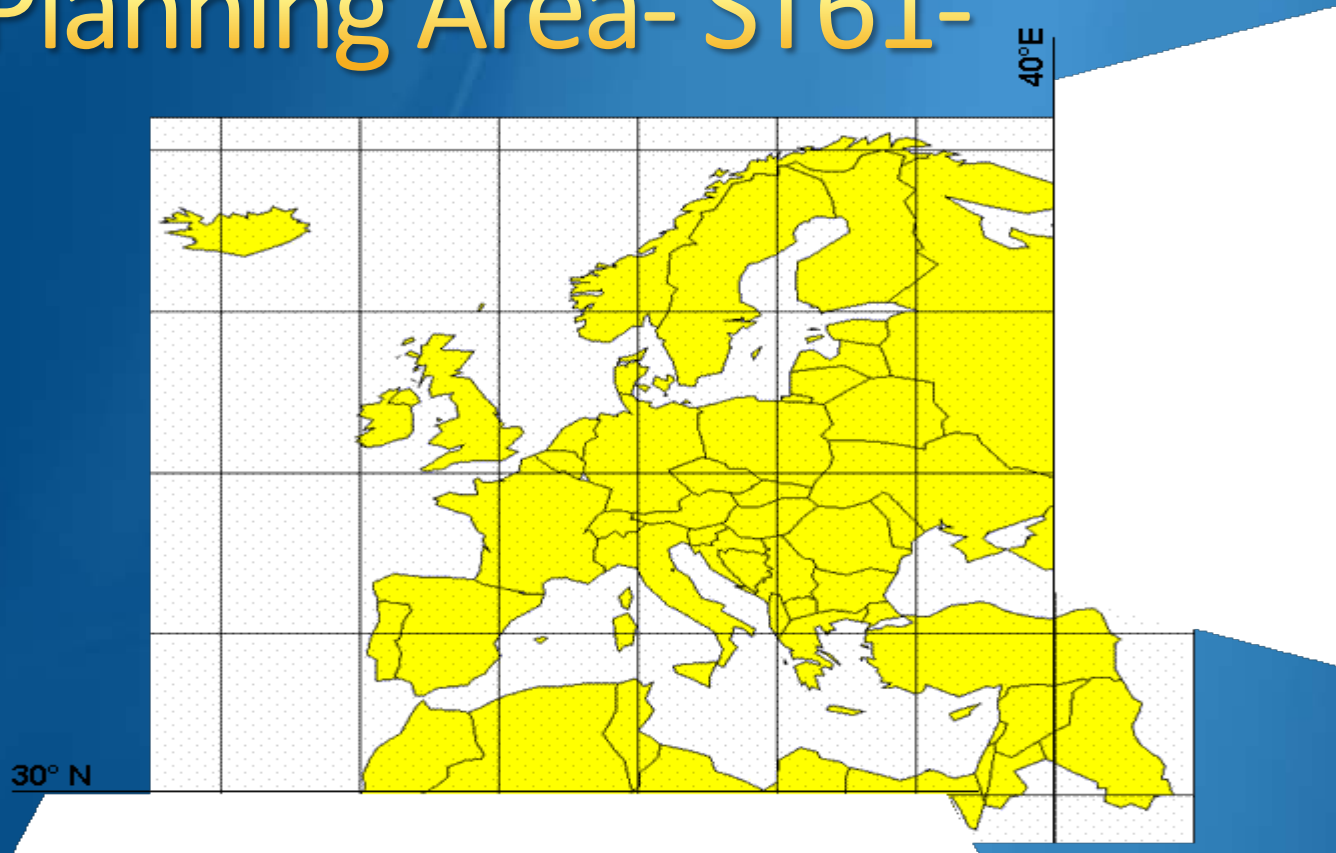
Shared band

● **ST 61 Revisions:**

● In 1987: GE84 Agreement (retrieve Sound from 87.5-100 MHz)

● In 2006: GE06 Agreement (retrieve the Band 174-230 MHz and 470-862 MHz)

Planning Area- ST61-

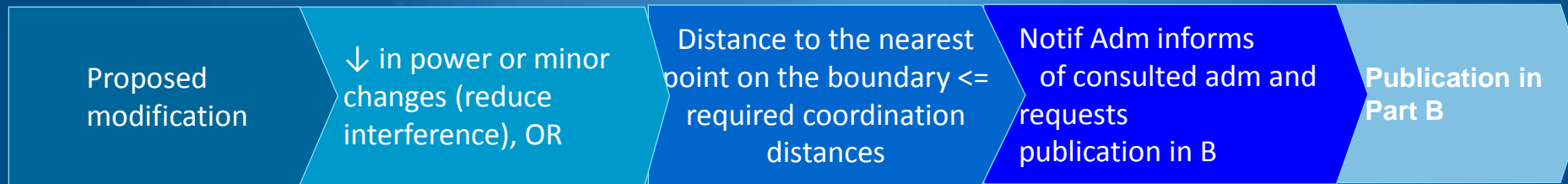


European Broadcasting Area: is bounded on the west by the western boundary of Region 1, on the east by the meridian 40° East of Greenwich and on the south by the parallel 30° North so as to include the northern part of Saudi Arabia and that part of those countries bordering the Mediterranean within these limits. In addition, Iraq, Jordan and that part of the territory of Syrian Arab Republic, Turkey and Ukraine lying outside the above limits are included in the European Broadcasting Area.

Modification procedures

–ST61- Exclusive band

Shortcut procedure



Normal procedure



**No comment=
agreement**

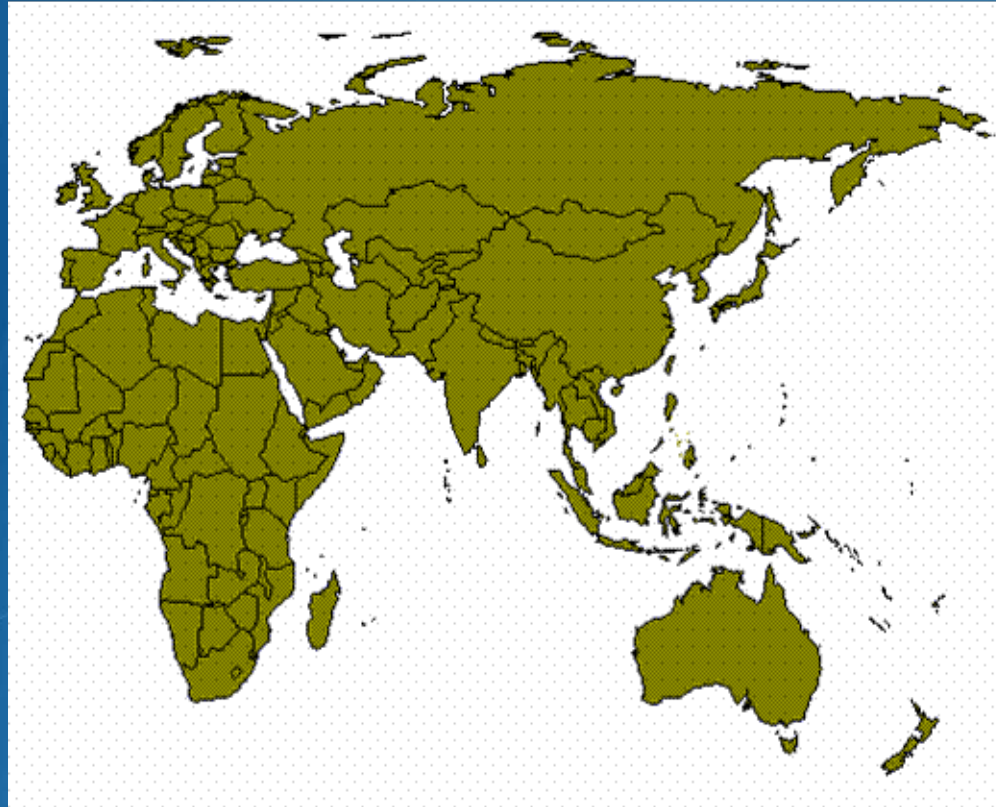
Shared band procedure

- The same as for exclusive bands, at the exception that there are no coordination distances in Appendix 1 of the Agreement

GE75 Plan- Quick view

- Entry into force : 23 November 1978
 - **LF** : 15 channels (148.5 - 283.5 kHz), R1(European Broadcastin Area)
 - **MF** : 120 channels (526.5 - 1606.5 kHz), R1+R3
 - **LPC** EMRP $\leq 1\text{kW}$ max : 3 channels
 - 1485 kHz
 - 1584 kHz, and
 - 1602 kHz

Planning Area- GE75-



Broadcasting Area: Regions 1 and 3

Modification to GE75 Plan

Channels other than Low Power Channels (Part A → Part B)



Low Power Channels LPC : 1 485 kHz, 1 584 kHz and 1 602 kHz (Direct to Part B)



Minor modifications (Direct to Part B): no increase in e.m.r.p. or minor change in the site (§4.9 of Annex 20)

Direct publication in Part B of GE75 ss

Protection criteria – GE75

- calculation use-

Protection ratios:

- Co-channel
 - 30 dB - stable
 - 27 dB - fluctuating
 - 8 dB – synchronized
- Adjacent channel
 - 0, 5, 7 and 9 dB – depending on degree of compression and bandwidth

Affected assignments – GE75

- Usable (E_u) field strength increased by 0.5 dB or more above E_{u-ref} (Annex 2, § 3.3.5)
 - E_{u-ref} : E_u when assignment entered the Plan.
 - Calculation points: on the boundary of the service area resulting from the first recording of the assignment in the Plan.

Deadlines for Plan GE75

Publication in Part A of a Special Section

- **16 weeks:** period for comments
 - **No comment** ⇨ **Agreement**
- **10 months:** : Reminder from BR after
 - **Publication in Part B shall be requested**
- **1 year** (from date of publication): modification 'not yet recorded' is **DELETED**

Life duration of a GE75 modification is **1 year**

Digital broadcasting- GE75

Come-back?

(Rules of Procedures Part A3)

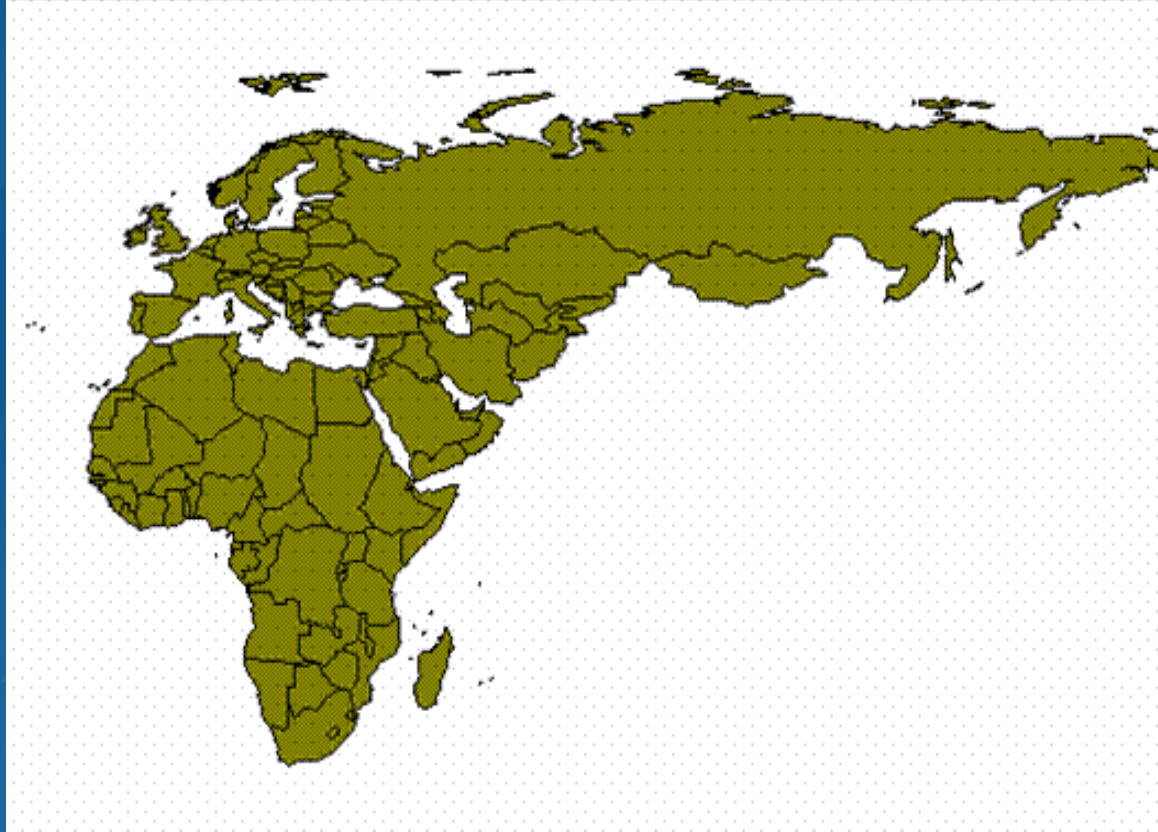
- After consideration of the relevant ITU-R studies, the Radio Regulation Board decided that any frequency assignment for AM broadcasting in the Plan may provisionally be used with digital modulation (transmission types DRM A2 or B2), provided the radiation is **reduced by at least 7 dB** in all directions, compared to the radiation of the AM modulated frequency assignment in the Plan.

Note: This Rule of Procedure is of a provisional nature (**December 2002**) until such time that it is confirmed by a competent Conference empowered to deal with the subject matter.

GE84 – Quick view

- Entry into force: 1st July 1987
- Frequency Plan + Appendix
- Frequency band: 87.5 MHz–108 MHz

Planning Area- GE84-



Broadcasting Area: The countries of Region 1 as defined in No. 393 of the Radio Regulations together with the Democratic Republic of Afghanistan and the Islamic Republic of Iran.

Need of Coordination

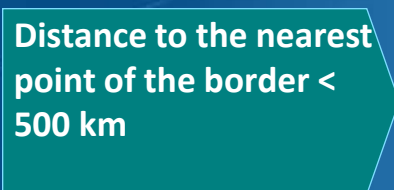
With BC



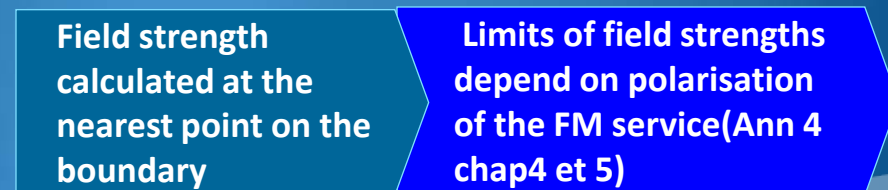
With ST61 BT in 87.5 – 100 MHz



Aeronautical Radionavigation >108 MHz



Fixed and mobile Services



Acceptable modifications

-GE84-

- FM station:
 - Resulting $E_u \leq 54 \text{ dB}(\mu\text{V}/\text{m})$
 - Increased by $\leq 0.5 \text{ dB}$ relative to the reference E_u ($E_u\text{-ref}$)
- TV Station:
 - Resulting $E_u \leq 52 \text{ dB}(\mu\text{V}/\text{m})$
 - Increased by $\leq 0.5 \text{ dB}$ relative to the reference E_u ($E_u\text{-ref}$)

Acceptable modifications

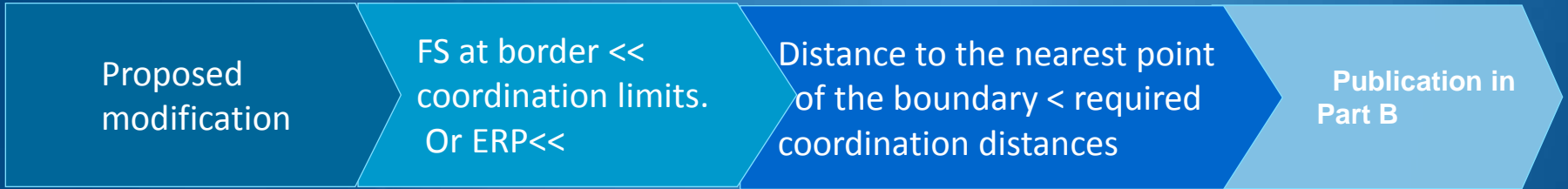
-GE84-

- Mobile station: 87.5-100 MHz Region 3 and 104-108 MHz Region1
 - Except aeronautical mobile (OR)
 - Interfering field strength
 - 18 dBu/m if FM is horizontal
 - 0 dBu/m if FM is vertical or mixed
- Fixed Station: Interfering FS ≤ 0 dB(μ V/m)
- Land Mobile: 87.5-88 MHz, in Region 1
 - FM horizontal
 - 14 dB(μ V/m) for AM land mobile
 - 24 dB(μ V/m) for FM land mobile
 - FM vertical
 - 6 dB(μ V/m) for AM land mobile
 - 16 dB(μ V/m) for FM land mobile

GE84 modification Procedures

-Article 4-

Shortcut procedure



Normal procedure (No deadline...)



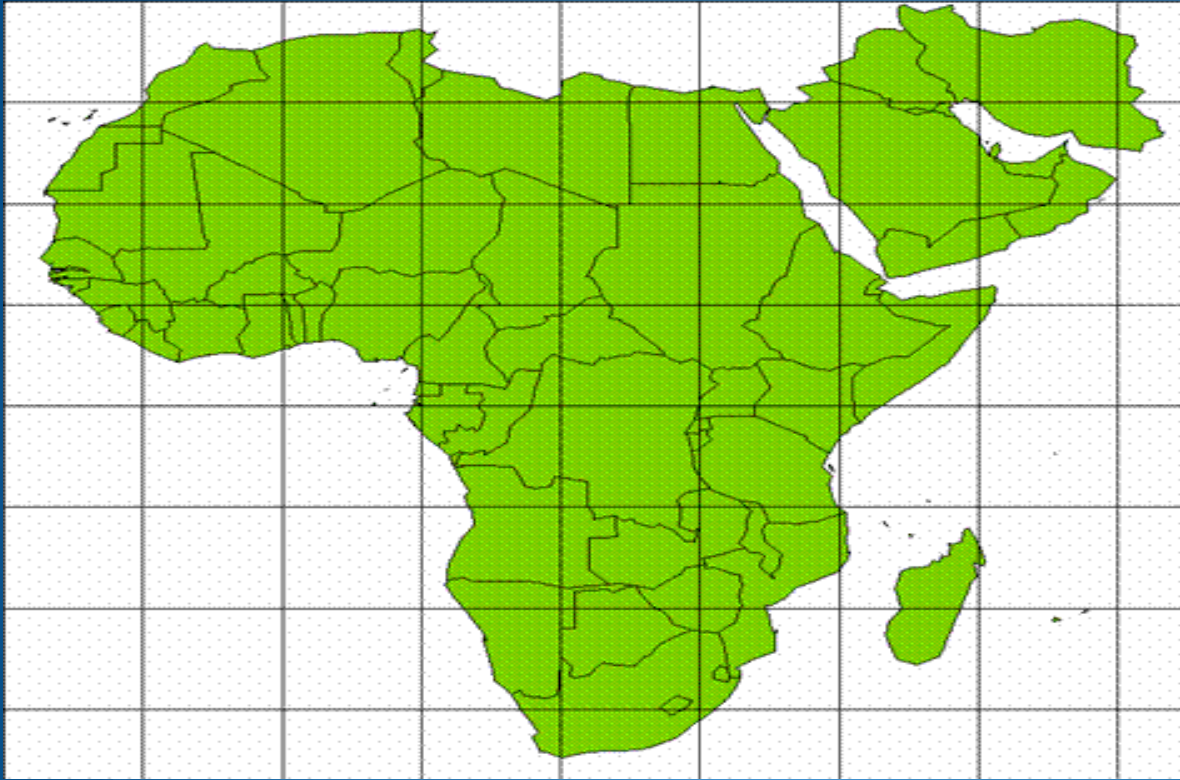
*No comment=
agreement*

GE89 Plan- Quick view

- Entry into force : 1 July 1992
- Frequency bands:
 - 41-68 MHz but limited use (RR5.169)
 - 230-238 MHz & 246-254 MHz (RR5.252)
- **ST 89 Revision:**
 - In 2006: RRC-06 for GE06



Planning Area- GE89-



Broadcasting Area: ABA means African countries, parts of countries, territories and groups of territories situated between the parallels 40° South and 30° North; islands in the Indian Ocean west of meridian 60° East of Greenwich, situated between the parallel 40° South and the great circle arc joining the points 45° East, $11^{\circ} 30'$ North and 60° East, 15° North; and islands in the Atlantic Ocean situated between the parallels 40° South and 30° North.

Modification Procedure

- Takes into account
 - Television service
 - Fixed services
 - Mobile services

GE89 modification Procedures

-Article 4-

Shortcut procedure



Normal procedure (No deadline...)



*No comment=
agreement*

Life duration of a GE89 modification is 465 days

Acceptable modifications

-GE89-

- Recommended criteria
 - Band I : Nuisance field <47 dB ($\mu\text{V}/\text{m}$)
 - Band III: Nuisance field <53 dB ($\mu\text{V}/\text{m}$)

HFBC - Article 12 of RR

- Adopted at WRC-1997
- In force from 1999
 - Equitable access to HF Band
 - Equal treatment of national and international needs
 - Efficient use of Spectrum
 - Reduction of incompatibilities.
- Frequency bands: 5 900- 26 100 kHz
- New one allocated on April 2009: 7 350–7 450 kHz Circular Letter CR/282.

The Planning Procedure

- Main Principles:
 - Equal access to the HF bands.
 - Equitable treatment of national and international requirements.
 - Efficient use of the spectrum.
 - Minimize incompatibility.

Current frequencies

Band	Frequency range (kHz)
6	5 900 – 6 200
7	7 100 – 7 300 *
7	7 300 – 7 350
7	7 350–7 450
9	9 400 – 9 900
11	11 600 – 12 100
13	13 570 – 13 870
15	15 100 – 15 800
17	17 480 – 17 900
18	18 900 – 19 020
21	21 450 – 21 850
25	25 670 – 26 100

* 7100-7200 not effective from A09-WRC-03-1

Main features

- Coordination between administrations:
 - Bilateral and multilateral.
 - Regional Coordination Groups.
- Coordination on a common technical base.
- Administrations may authorise broadcasters or other organisations to coordinate on their behalf.

Particularities

- Two seasonal periods:
 - “Summer” – Season A.
 - “Winter” – Season B.
 - Two seasonal schedules: A and B
 - **Season A:** From the last Sunday of March to the last Sunday of October
 - **Season B:** From the last Sunday of October to the last Sunday of March
- Implementation: 0100 UTC

Who can notify?

- Administrations
- Authorized organizations:
 - Broadcasters.
 - Frequency managers.
- Administrations must advise the BR (in writing):
 - Name of the authorized organization.
 - Scope of the authorization.

How to notify?

- The common electronic format of the requirement file must be used.
- Submissions:
 - as from January 2009 (CR/304) through

WIFSAT web interface

What to notify?

- The WHOLE schedule for the seasonal period must be submitted.
- When no amendments – inform the BR without submitting schedule.
- The common ASCII text format must be used (<http://www.itu.int/ITU-R/terrestrial/broadcast/hf/index.html>).

When to notify?

- Circular letter to administrations:
 - November – for Season A.
 - May – for Season B.
- 4 months before the Start Date:
 - End of December – for Season A.
 - End of July – for Season B.
- Any time during the season – at least 2 weeks before the closing date.

No schedule is submitted?

- The BR uses the requirements from the previous corresponding season.
- **Once only!** Then requirements are suppressed from the schedule.

How is the data published?

- On a CD-ROM (11 per year):
 - 2 Tentative Schedules (T1, T2).
 - 2 or 3 Schedules (S1, S2, S3).
 - Final Schedule (F).
- To subscribers only.



What does the CD-ROM contain?

- Updated seasonal schedule.
- Propagation and compatibility analysis.
- Latest versions of ITU HFBC software.

How to subscribe?

- Contact ITU Sales and Marketing Service:



sales@itu.int



Sales and Marketing Service

Places des Nations

CH-1211 Genève 20,

Switzerland

Article 11 of RR

Notification procedure

- General procedure -

Notification procedure

-Article 11 BC/BT-

Definition: To notify an assignment in conformity with the relevant Plan and intended to be put into Service.

MIFR: Master of International Frequency Register.

The procedure if successful, leads to the recording of the assignment in MIFR .

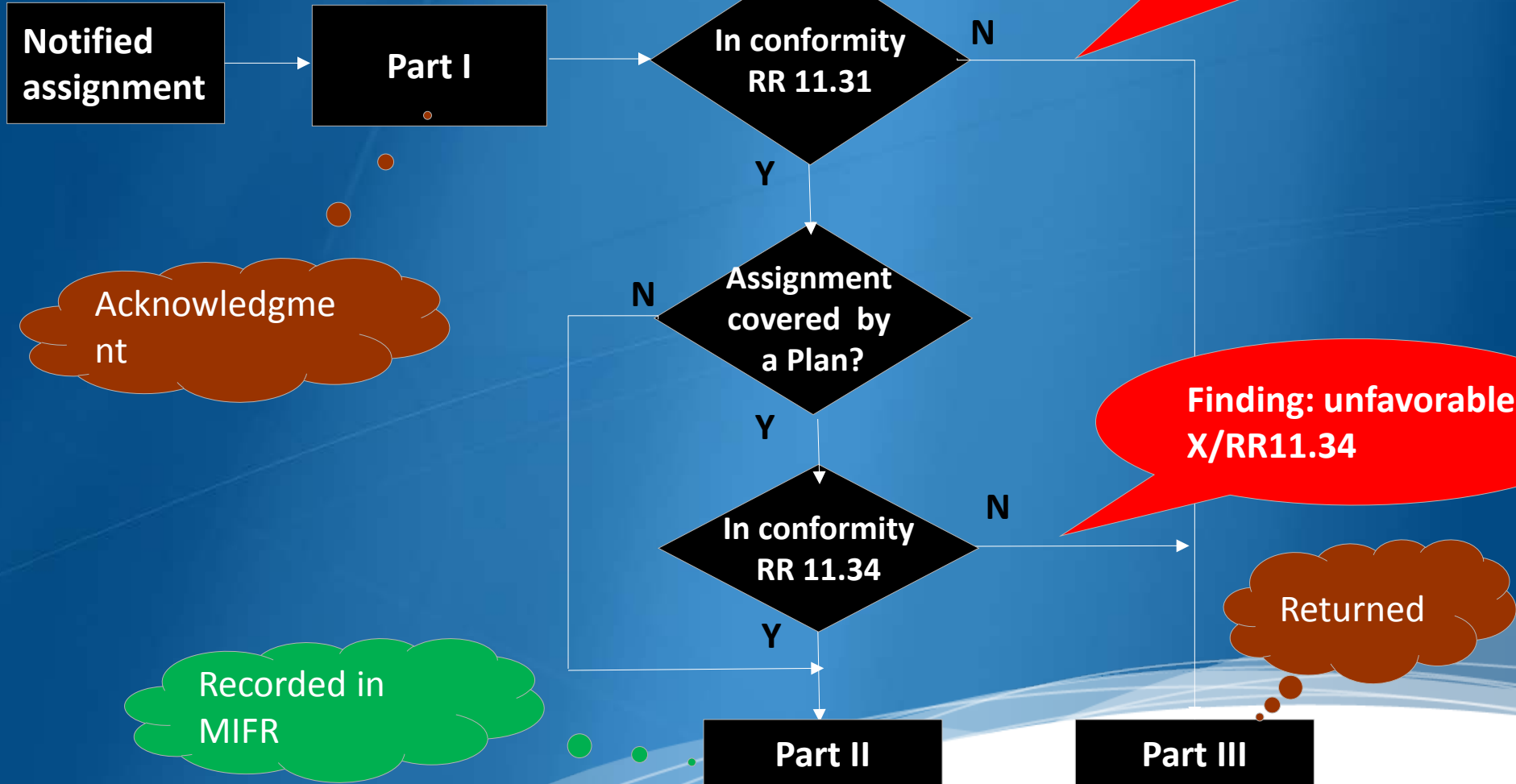
Why :

- Inform others of the bringing into use of a frequency assignment
- Recording in the MIFR results in rights and obligations for the notifying Administration

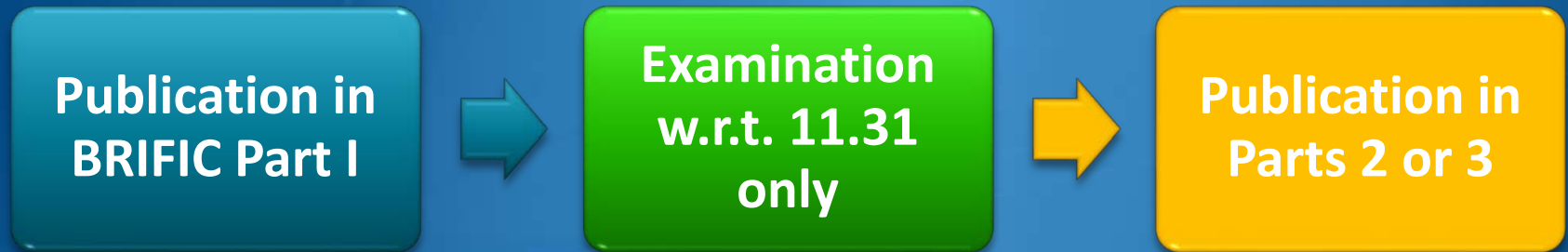
Notification procedure

- Non planned bands: Article 11.
- Planned bands described in:
 - ST61: Article 5
 - GE75:Article 5
 - GE84: Article 7
 - GE89 :Article 5

Notification procedure - In general-

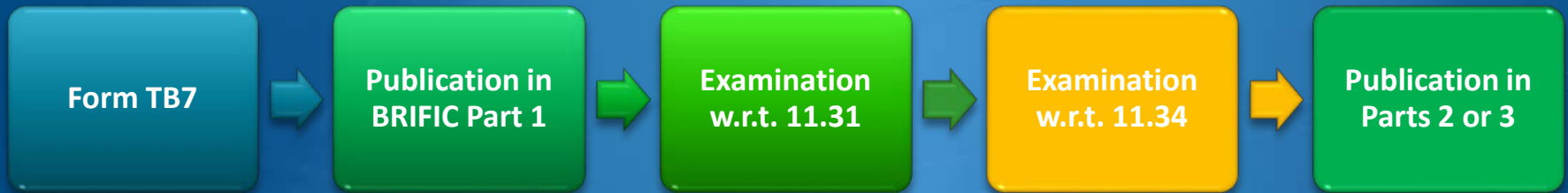


Notification procedure non Planned > 28 MHz



- Objections to Publication are not receivable
- In Case of interference, administrations can apply procedures of Article 15.

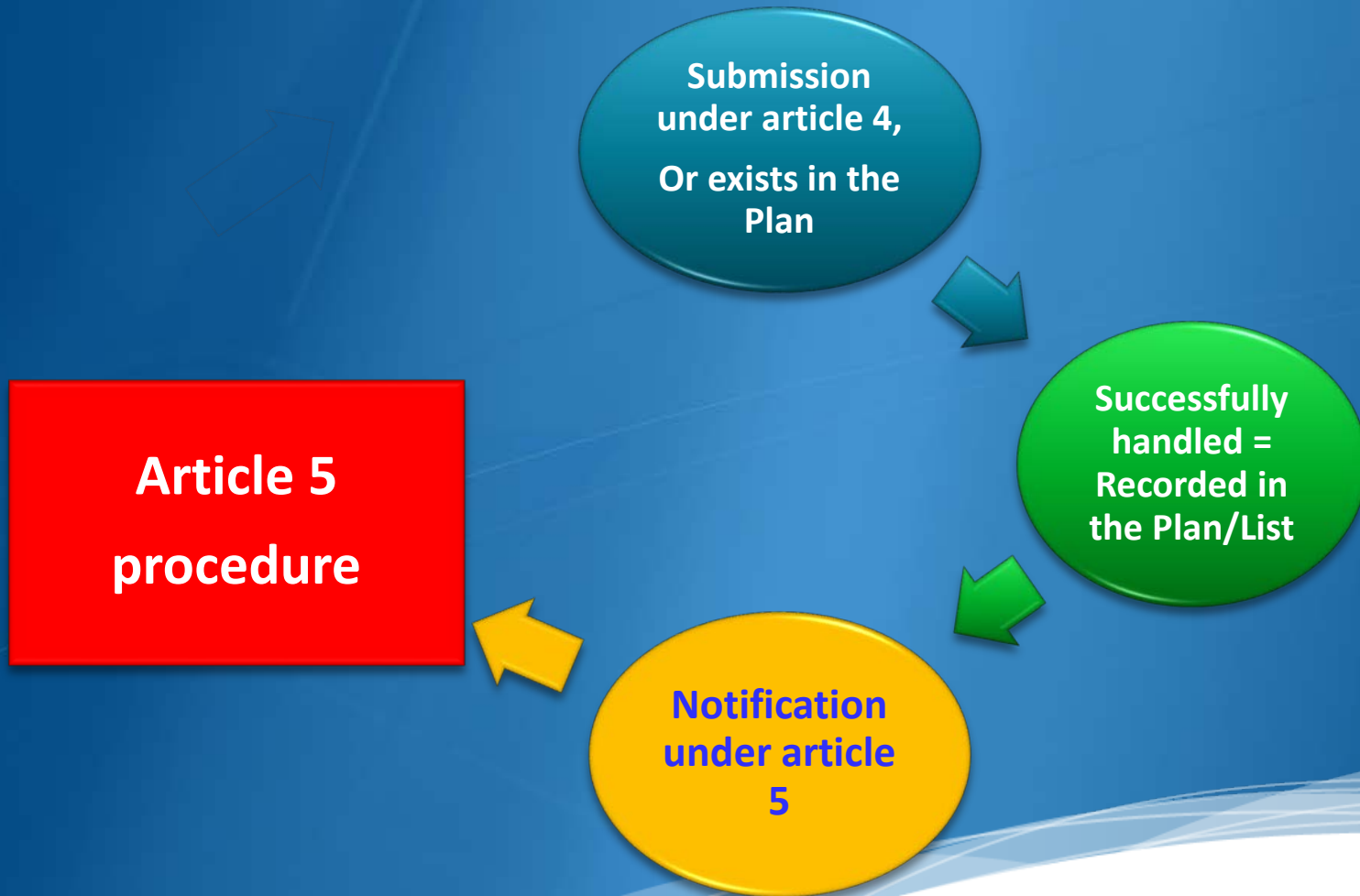
Notification Procedure -planned bands-



Parameters shall be:

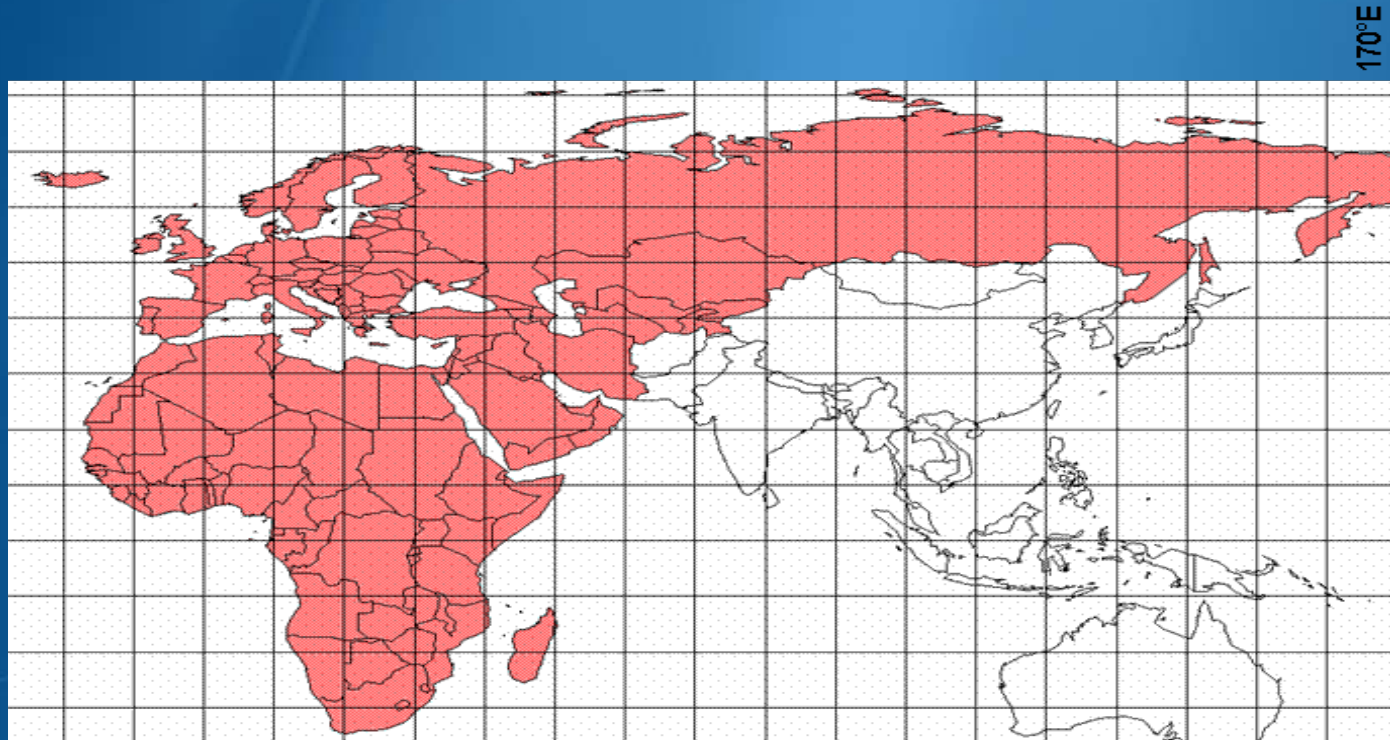
- The same as those in the relevant Plan, or
- Within the specified tolerations

Condition for planned bands



GE06 Agreement

Planning Area –GE06



Planning area: Region 1 (parts of Region 1 situated to the west of meridian 170° E and to the north of parallel 40° S, except the territory of Mongolia) and in the Islamic Republic of Iran

Digital broadcasting

Plan entries-Assignment Code

Plan Entry Code	Description
1	One assignment only
2	Single Frequency Network (SFN)
3	One allotment only
4	Allotment with linked assignments and SFN_Ids
5	Allotment with single linked assignment and no SFN identifier



Assignment code	Description
S	Single assignment
L	Linked assignment
C	Converted assignment

**Modification procedure
- GE06 Agreement-**

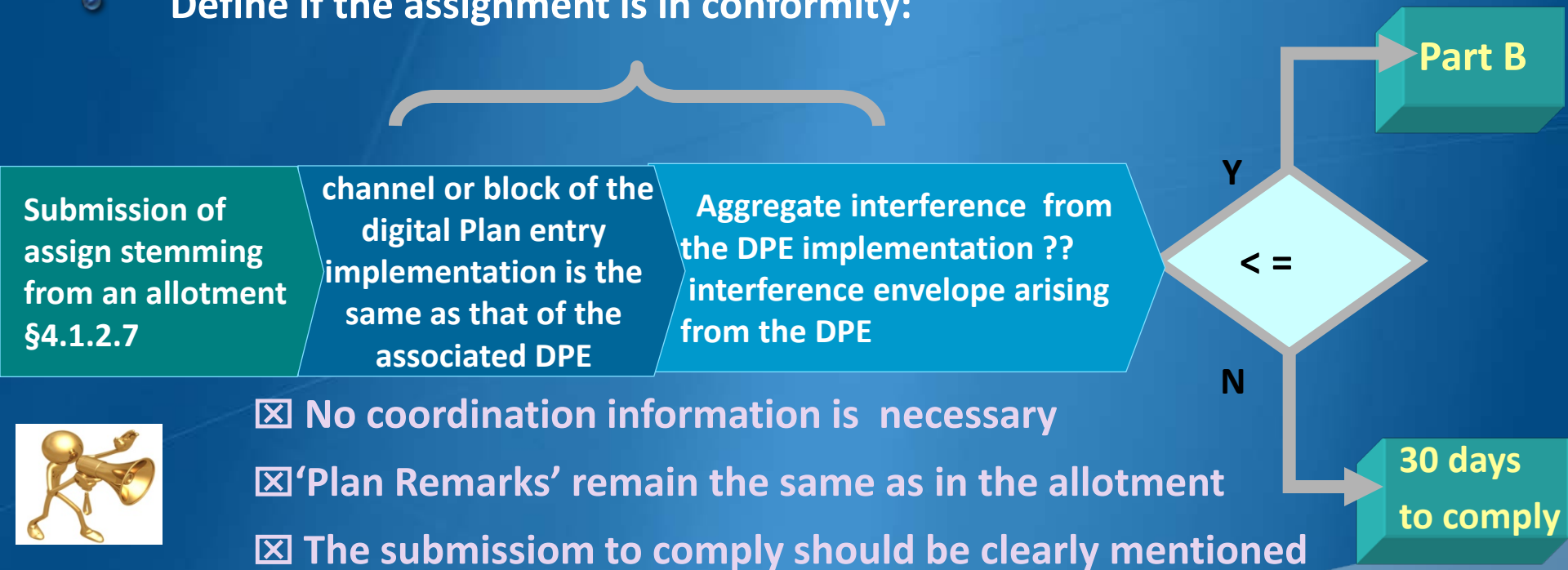
Basic definitions

- Plan modification definition (§ 4.1 and 4.2 of Article 4):
 - Change characteristics of an allotment or assignment already in the Plans;
 - Add an allotment or assignment to the Plans;
 - Add an assignment stemming from an allotment to the digital Plan;
 - Cancel (suppress) from the Plans an allotment or an assignment.

Conformity examination

Article 4

- Specific to GE06D **ONLY** ;
- Section II of appendix 4;
- Define if the assignment is in conformity:

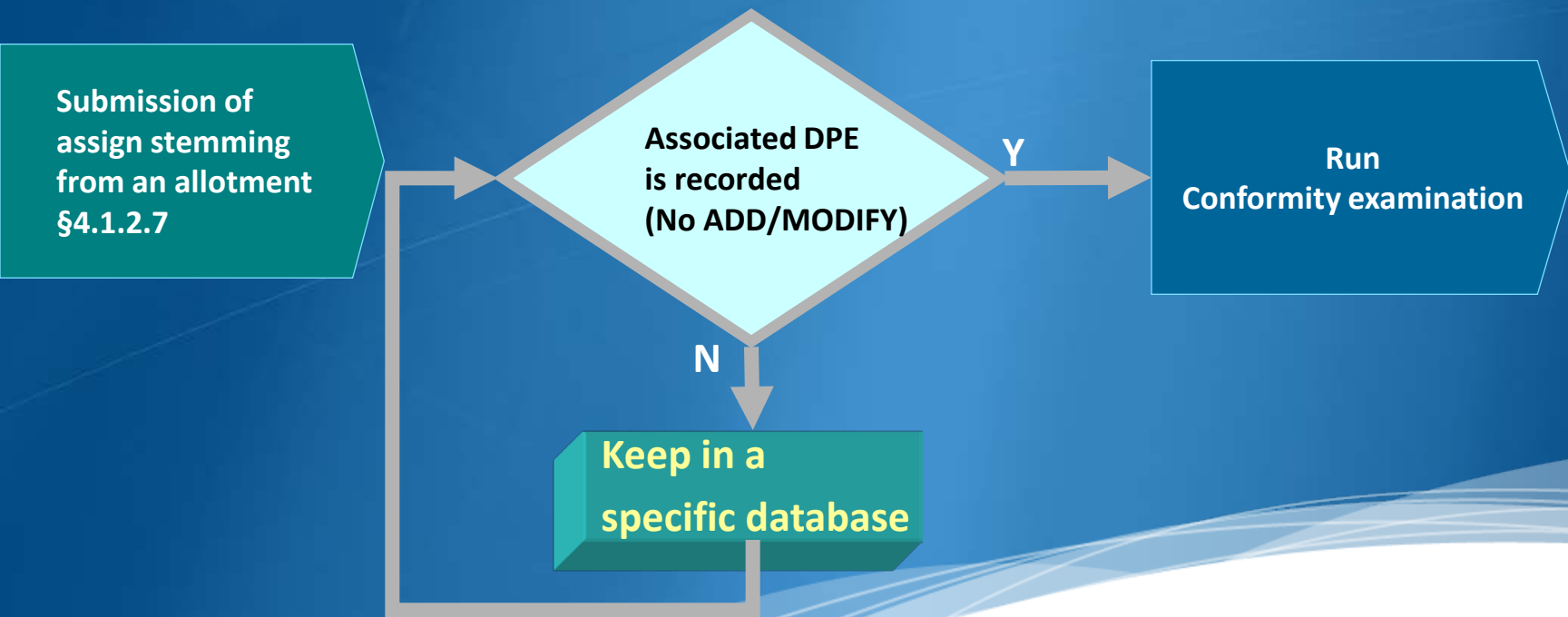


- ☒ No coordination information is necessary
- ☒ 'Plan Remarks' remain the same as in the allotment
- ☒ The submission to comply should be clearly mentioned

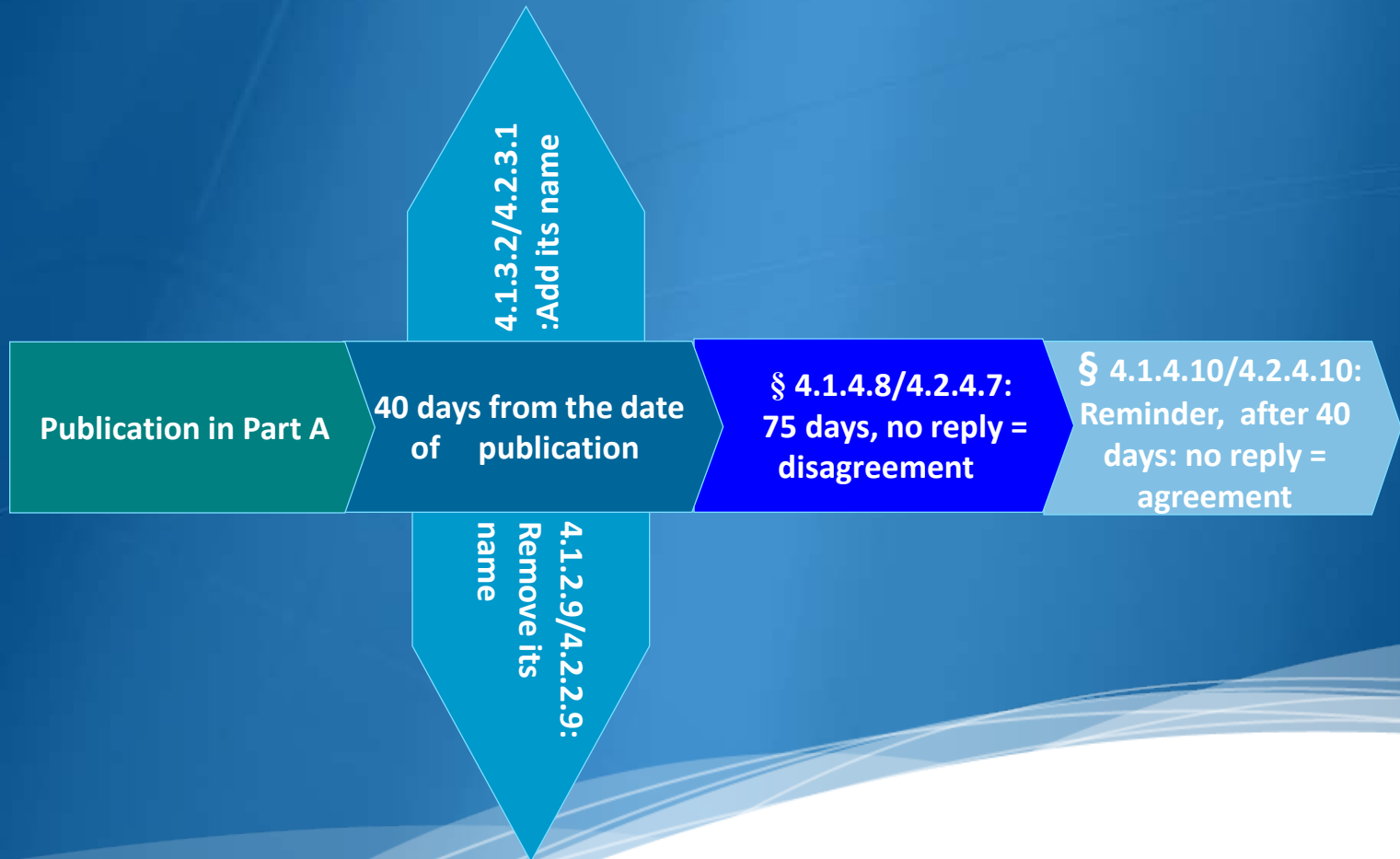


Conformity examination GE06D case

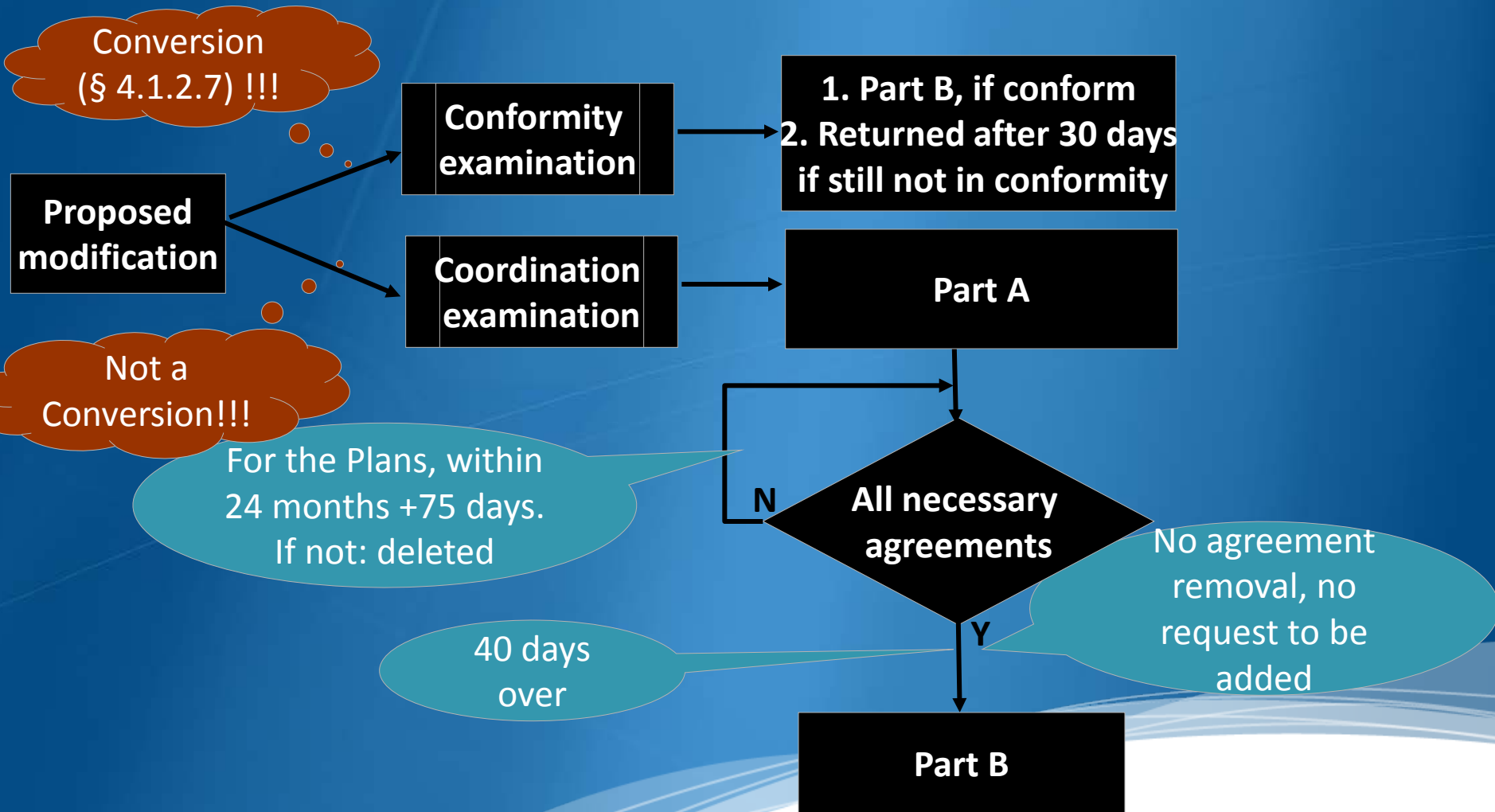
- Specific case: Submission of assignments stemming from an allotment being modified: Part A10 of Rules of procedures:



Coordination with affected administrations



Publication process—Article 4



Specific features of coordination procedure

- No reply = no agreement
- Agreement (art4) can be provided for a **defined** duration
- No possibility to delete the remarks from the Plan entries in Article 4
- Deletion of the proposed modification of the Plans if not recorded after **24 months and 75 days**
- at the end of the **transition period**
 - All analogue assignments will be deleted
 - All Plan remarks with respect to analogue will be deleted

What does it mean?

End of Transition period?

- All analogue assignments will be deleted from the Plan
- All Plan remarks with respect to analogue will be removed
- GE06 provisions will not be applicable, anymore, to Analogue assignments.

Article 11 of RR

Notification procedure

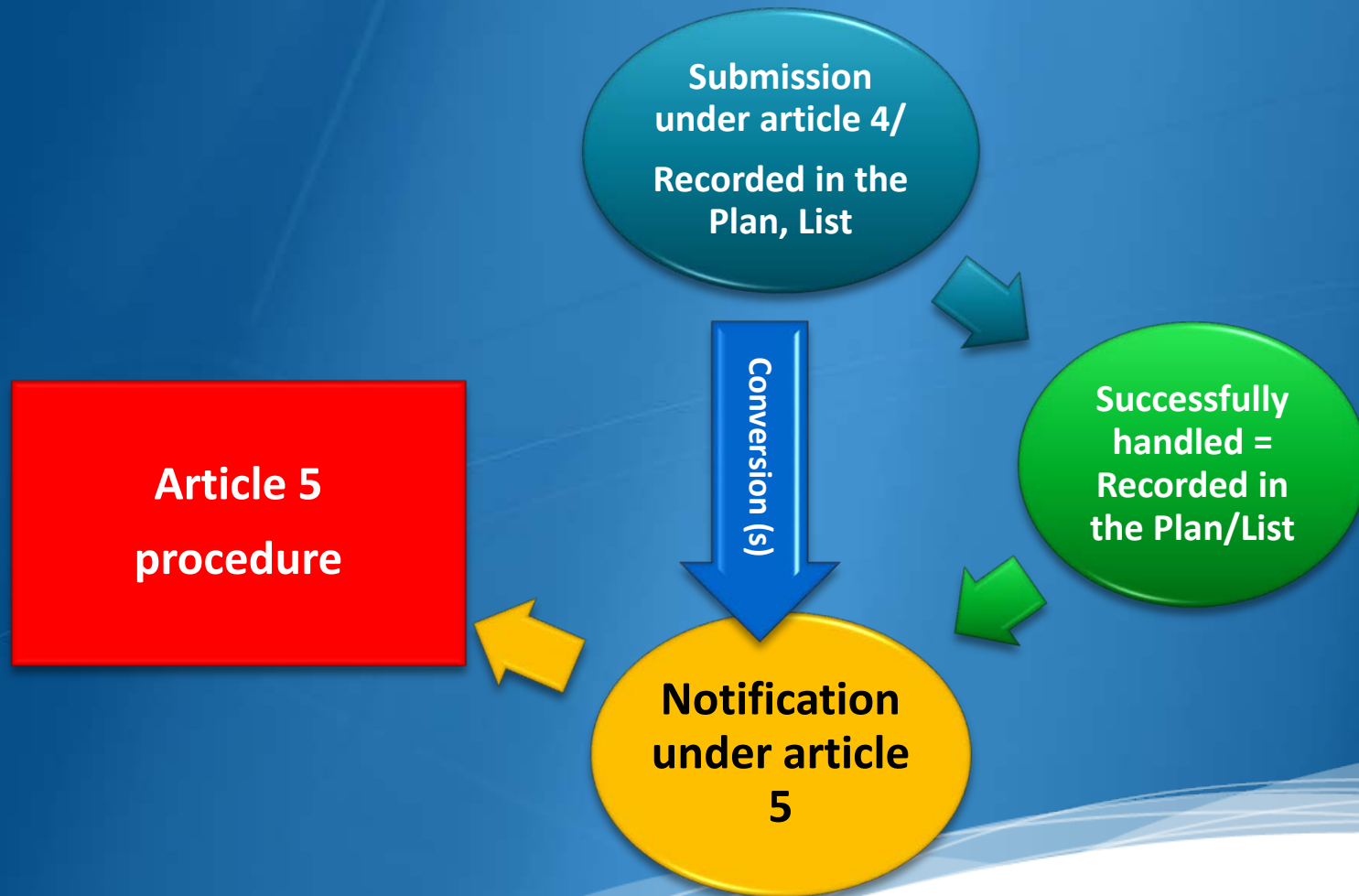
- Article 5 of GE06 Agreement -

- Normal cases -

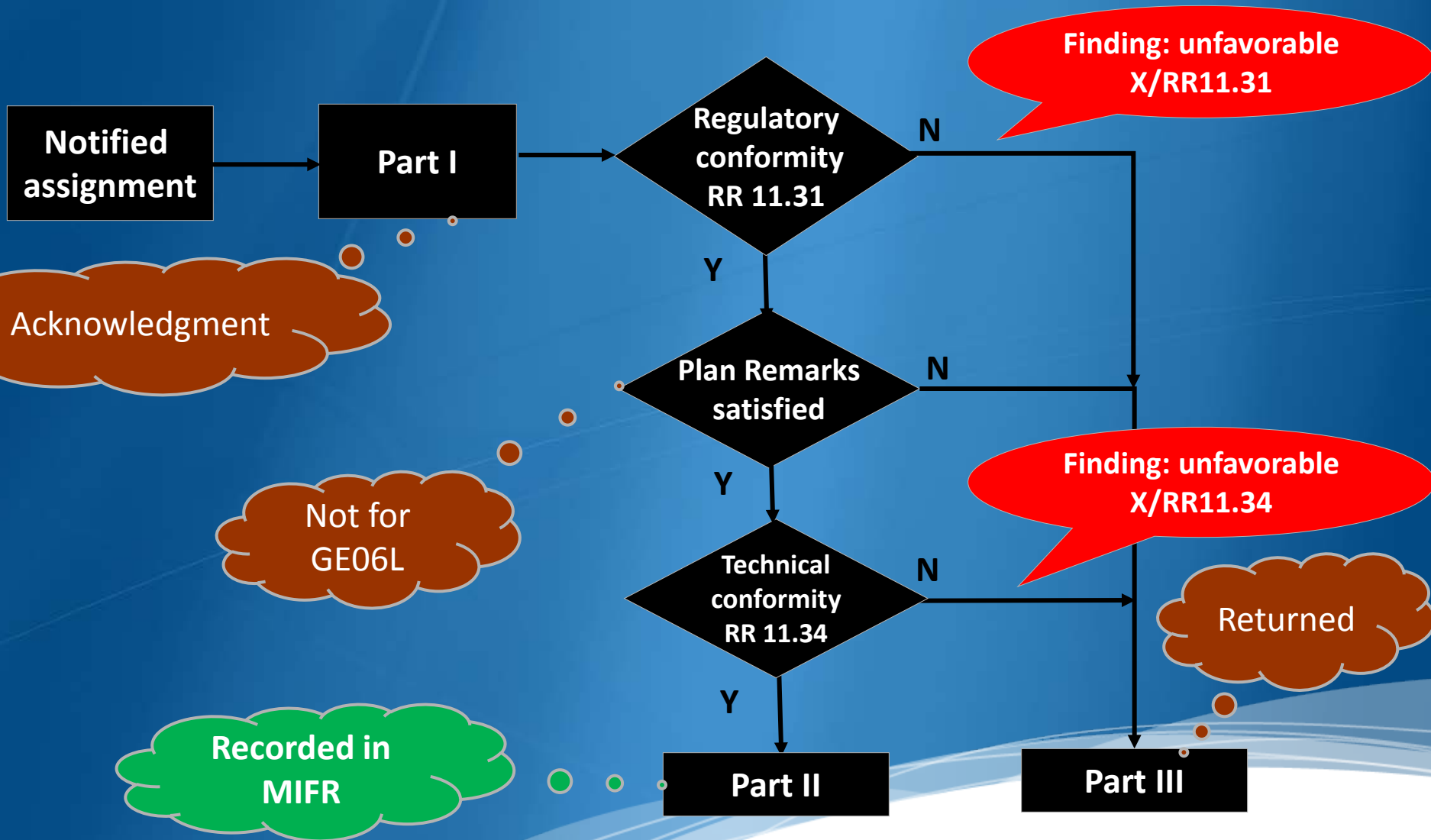
Notification procedure GE06

- *When an administration proposes to bring into use an assignment to a station, it shall notify to the Bureau, in accordance with the provisions of Article 11 of the Radio Regulations.*
- Before notifying, ensure that the relevant assignment is RECORDED in the relevant Plan:
 - Exception for the assignment stemming from allotment, which can be notified directly under article 5
- GE06A and D:
 - If Plan remarks, notify with all necessary agreements
 - Application of Section II of Annex 4

Steps to MIFR recording



Article 5 procedure



Article 11 of RR

Notification procedure

- **Article 5 of GE06 Agreement -**

- **Other than normal cases -**

Article 5 of GE06: other cases

- Conversion of an assignment(s) from an allotment of the GE06 Plan
- Paragraphs 5.1.2e and 5.1.3

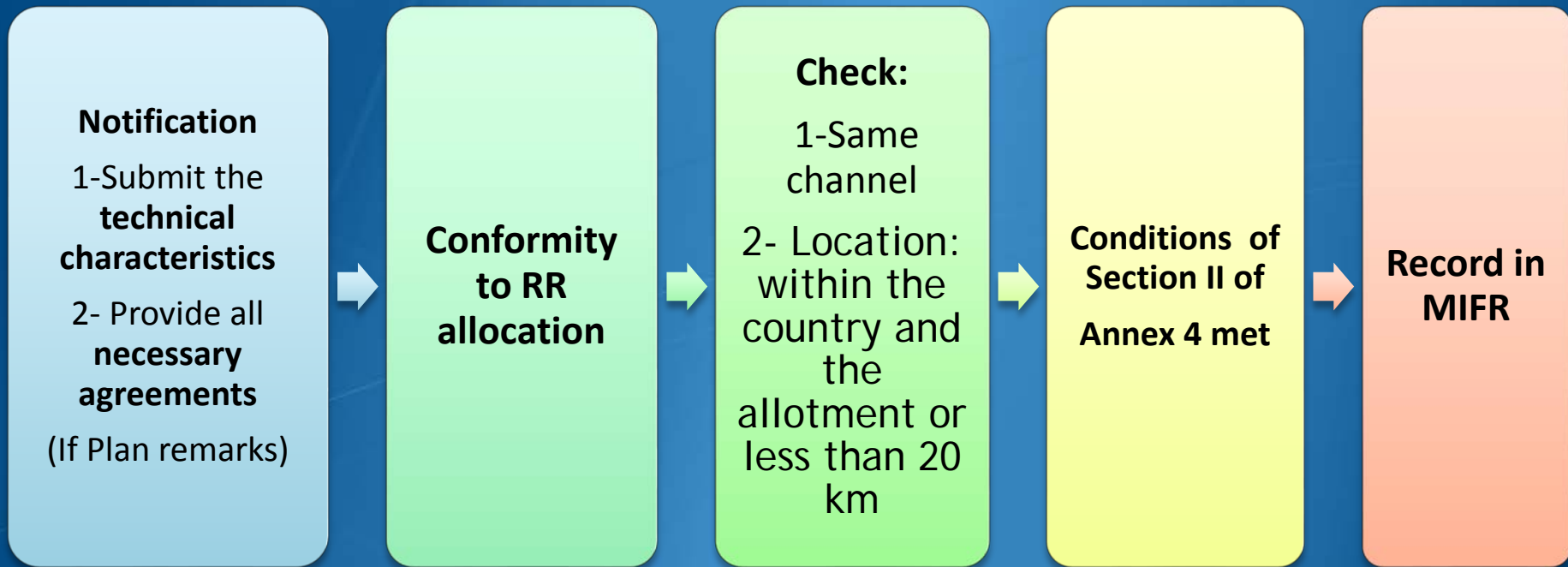
Specificities of a conversion

- It is possible to notify directly applying article 5 of GE06 Agreement;
- The agreement from neighbouring administrations is necessary only when the allotment bears Plan Remarks.

Conditions of the conversion: Section II of Annex 4 of GE06 Agreement

- The **channel or block** of the digital Plan entry implementation is **the same** as that of the associated digital Plan entry.
- The assignment must be located:
 - **Within** the allotment area or in a distance of **less than 20 km** of the allotment borders,
 - Within the notifying country borders.
- The aggregate interference from the digital Plan entry implementation shall not be higher than the interference envelope arising from the digital Plan entry.

Notification of a conversion



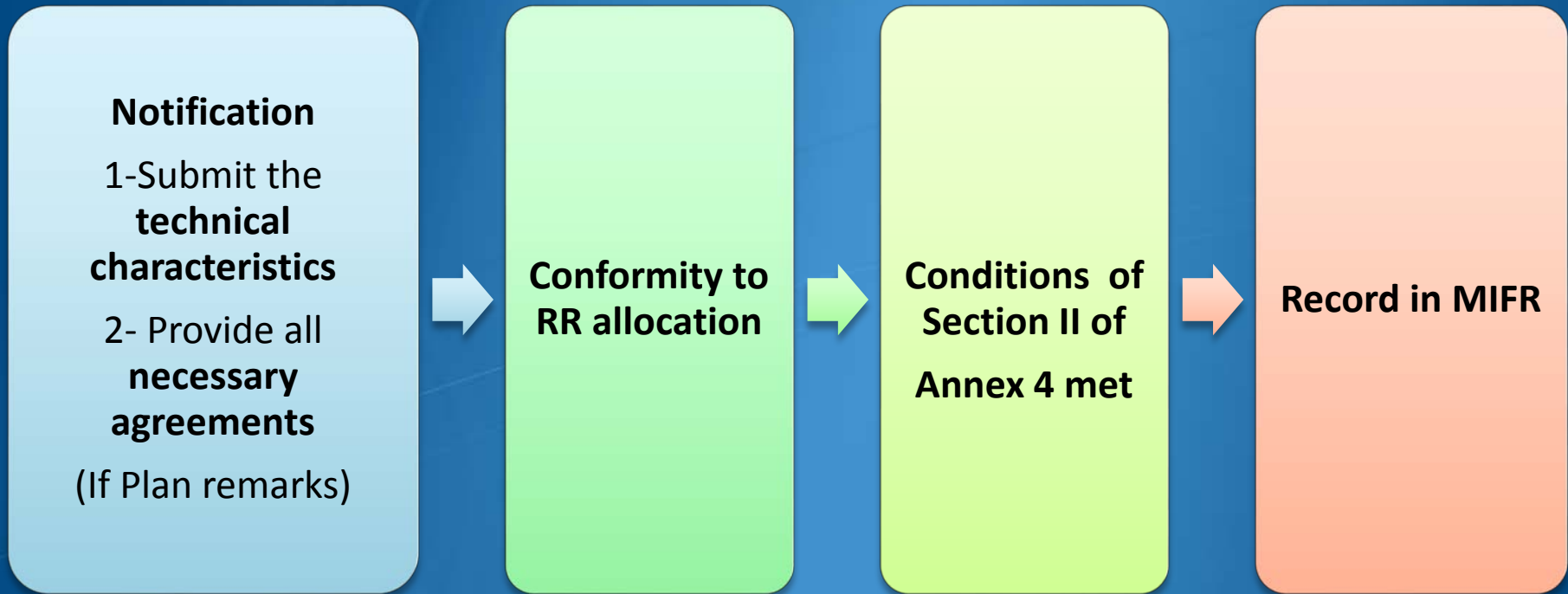
Notification of DTT systems other than DVB-T and T-DAB

- **5.1.2e:** in the case of the use of an entry in the digital Plan, with different characteristics, within the DVB-T or T-DAB systems, the conditions specified in *Section II of Annex 4* are met.
- **5.1.3:** A digital entry in the Plan may also be notified with *characteristics different* from those appearing in the Plan, for transmissions in the *broadcasting service or in other primary terrestrial services* operating in conformity with the *Radio Regulations*, *provided* that the peak power density in any *4 kHz* of the above-mentioned notified assignments shall not exceed the spectral power density in the same *4 kHz* of the digital entry in the Plan. Such use shall not claim more protection than that afforded to the above-mentioned digital entry.

Notification form for 5.1.2e

- As 5.1.2e is applied only for the notification of *DVB-T* and *T-DAB systems* :
 - The electronic notification form is **GS1**.

Notification according to 5.1.2e



Notification according 5.1.3

Rules of Procedures - Part A10- Art5

- The Board understands that the examination of the **4 kHz condition** is only the **first step** that the Bureau would need to carry out under No. 5.1.3 of the GE06 Agreement.
- If the examination of the peak power density is **within the specified limits**, then the Bureau will proceed **to conformity examination** (Section II of Annex 4).
- Only **assignments** can be notified.
- Adm. needs to supply all the **relevant characteristics** that are necessary.
- If the digital Plan entry bears a remark, the Adm. shall provide all the necessary agreements.

Notification conditions

5.1.3

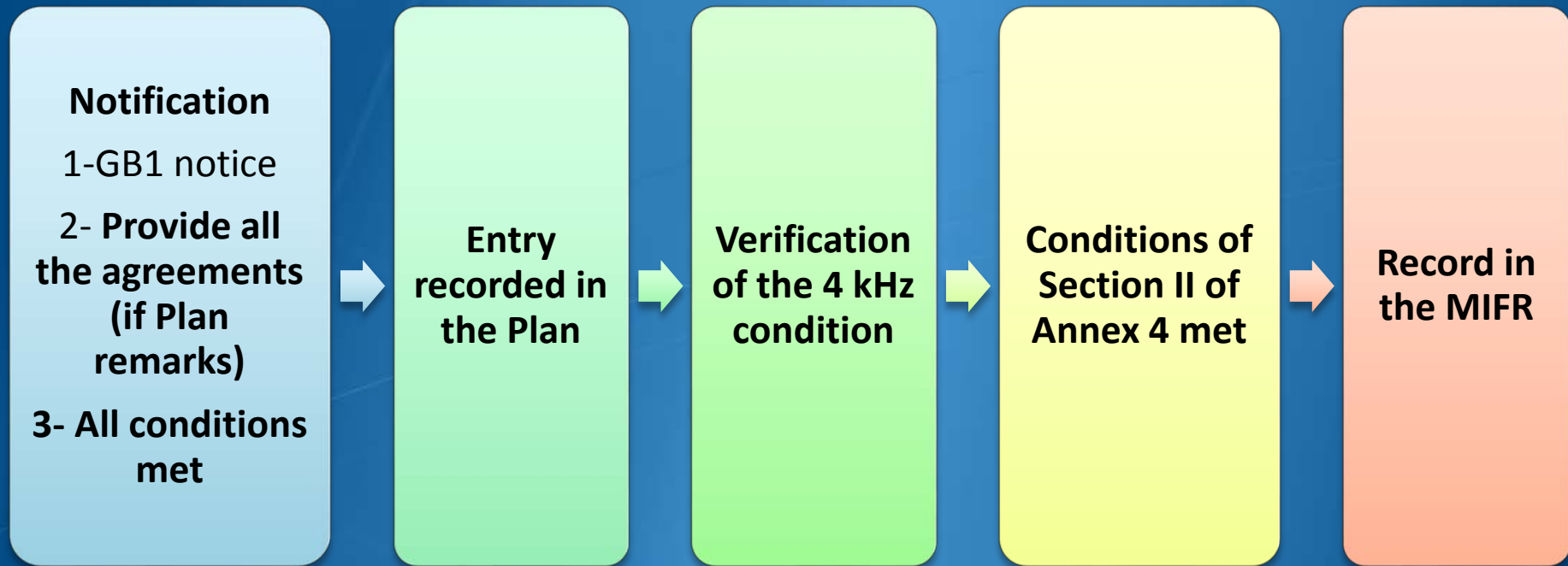
- Operating in conformity with the Radio Regulations.
- the peak power density in any 4 kHz of the above-mentioned notified assignments shall not exceed the spectral power density in the same 4 kHz of the digital entry in the Plan.
- not claiming more protection than afforded to the associated Plan entry.
- Only assignment/No allotment

Notification form for 5.1.3 (circular Letters CR/261 and 262)

- For a digital assignment in the Broadcasting service: **GB1**
- For an assignment in a Service other than Broadcasting: **G11, G12, G13, G14**
- For an analogue assignment in the Broadcasting service :**G02**

Notification according to 5.1.3

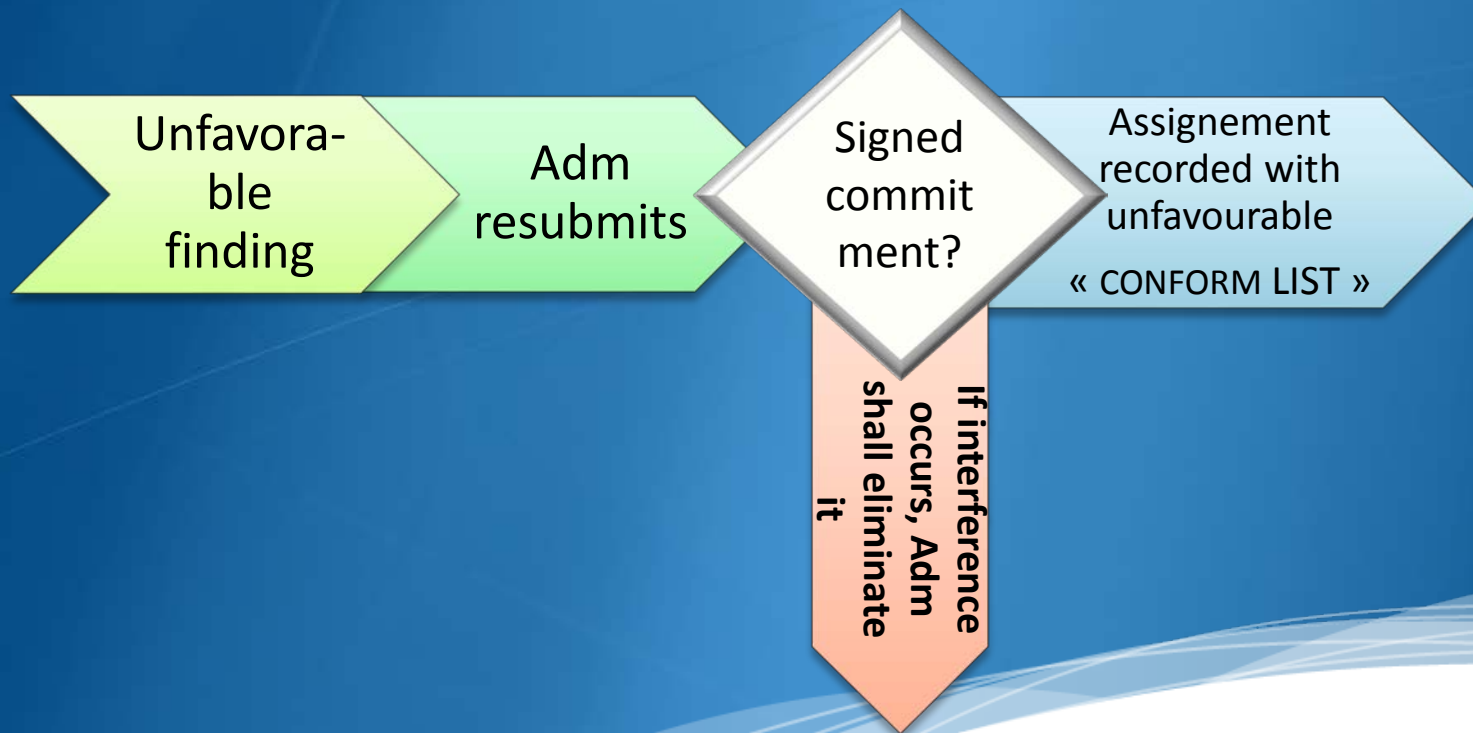
Rules of Procedures - Partie A10



Another chance... Resubmission

- 5.1.6 and 5.1.7 for the Plans

Without the signed commitment, the notice is returned to Adm.



DVB-T
DVB-T2
MDTV

ITU-R and GE06 Agreement

Overview

- DVB-T
- DVB-T2
- Comparison
- GE06 provisions for DVB-T2
- Notification under article 5 of GE06
- Conclusions

DVB-T

- DVB-T is a technical standard, developed by the DVB Project, that specifies the framing structure, channel coding and modulation for digital terrestrial television (DTT) broadcasting.
- The first version of the standard was published in March 1997 and in the twelve years since then it has become the most widely adopted DTT system in the world.
- It is a flexible system that allows networks to be designed for the delivery of a wide range of services, from HDTV to multichannel SDTV, fixed, portable, mobile, and even handheld reception.
- In Region 1: GE06 agreement, for the Bands:
 - 174-230 MHz, 470-862 MHz

DVB-T2

- **2nd Generation Terrestrial:** The first version was published in 2009
- DVB-T2 is the world's most advanced digital terrestrial television (DTT) system, offering more robustness, flexibility and at least 50% more efficiency than any other DTT system.
- It supports SD, HD, mobile TV, or any combination.

DVB-T 2 DVB-T2?

	DVB-T	DVB-T2
FEC (forward Error Correction)	Convolutional Coding + Reed Solomon 1/2, 2/3, 3/4, 5/6, 7/8	LPDC+BCH 1/2, 3/5, 2/3, 3/4, 4/5, 5/6
Modes	QPSK, 16QAM, 64QAM	QPSK, 16QAM, 64QAM, 256QAM
Guard interval	1/4, 1/8, 1/16, 1/32	1/4, 19/256, 1/8, 19/128, 1/16, 1/32, 1/128
FFT size	2k, 8k	1k, 2k, 4k, 6k, 8k, 16k, 32k

Source: DigiTAG

Advantages of Digital TV Frequency saving!!

Format	Source coding	No of progs DVB-T	No of progs DVB-T2	No of progs DVB-T	No of progs DVB-T2
		Fixed MUXing		Fixed MUXing FUTURE	
SD	MPEG-2	6	10	6	10
SD	MPEG-4/AVC	9	13	10	15
HD-720p	MPEG-4/AVC	3	4	3	5
HD-1080i	MPEG-4/AVC	2	4	3	4
		Statistical MUXing		Statistical MUXing FUTURE	
SD	MPEG-2	8	13	8	13
SD	MPEG-4/AVC	11	16	13	19
HD-720p	MPEG-4/AVC	3	5	3	5
HD-1080i	MPEG-4/AVC	3	4	3	5

Number of programs per multiplex for fixed reception with DVB-T: 64QAM 1/2, 3/8 $K=1/32$ and DVB-T2: 256QAM 2/3, 1/8 $K=1/32$

DVB-T/DVB-T2

- DVB-T2 offers an increased efficiency of 30-50% in its use of spectrum compared to DVB-T.
- DVB-T2 provides Data rates between 50% and 90% higher than DVB-T for the same level of robustness
- DVB-T2 provides larger scale SFN than DVB-T

DVB-T2 and G06 Agreement

- Plan modification: Article 4
 - **No possibility**
- Notification under article 5 of GE06:
 - **Conditions to respect according to provision 5.1.3.**

WHY NOT POSSIBLE?

GE06 Agreement:

- 3.1.1: The digital Plan consisting of two parts: the 174-230 MHz band and the 470-862 MHz band (comprising T-DAB Plan assignments, T-DAB Plan allotments, DVB-T Plan assignments, DVB-T Plan allotments).
- 3.2 *Annex 2*: Technical elements and criteria used in the development of the Plan and the implementation of the *Agreement*.
 - **Annex 2 , 1.1.1 Digital terrestrial television broadcasting (DTTB):** Digital television systems in the terrestrial broadcasting service which are described in Recommendation ITU-R BT.1306-3. **DVB-T** (Terrestrial Digital Video Broadcasting) corresponds to the DVB system, which is designated as “System B”.

Provision 5.1.3

- 5.1.3 A digital entry in the Plan may also be notified with **characteristics different from those appearing in the Plan**, for transmissions in the **broadcasting service** or in *other primary terrestrial services* operating in conformity with the *Radio Regulations*, provided that **the peak power density in any 4 kHz** of the above-mentioned notified assignments shall **not exceed the spectral power density in the same 4 kHz of the digital entry in the Plan**. Such use shall not claim **more protection** than that afforded to the above-mentioned digital entry.

Only assignments under 5.1.3

Rules of Procedure A10

- Provision 5.1.3 deals with notification of a digital broadcasting entry in the Plan with characteristics different from those appearing in the Plan.
- The definition of the “digital Plan entry”, as contained in No. 1.3.18 of Annex 1 to the GE06 Agreement, includes both assignments and allotments.
- However, and in view of the formulation of No. 5.1 of the GE06 Agreement, the Board concluded that, in the application of No. 5.1.3 of the GE06 Agreement, administrations can notify only **frequency assignments**.

Notification conditions 5.1.3

- Operating in conformity with the Radio Regulations.
- the peak power density in any 4 kHz of the above-mentioned notified assignments shall not exceed the spectral power density in the same 4 kHz of the digital entry in the Plan.
- not claiming more protection than afforded to the associated Plan entry.

Rules of Procedure A10 on 5.1.3

- The Board decided that the verification of the 4kHz condition is only the **first examination**
- If the examination of the peak power density is within the specified limits, then the Bureau will run the **conformity examination** (Section II of annex 4 of GE06 Agreement)

No claim for more protection

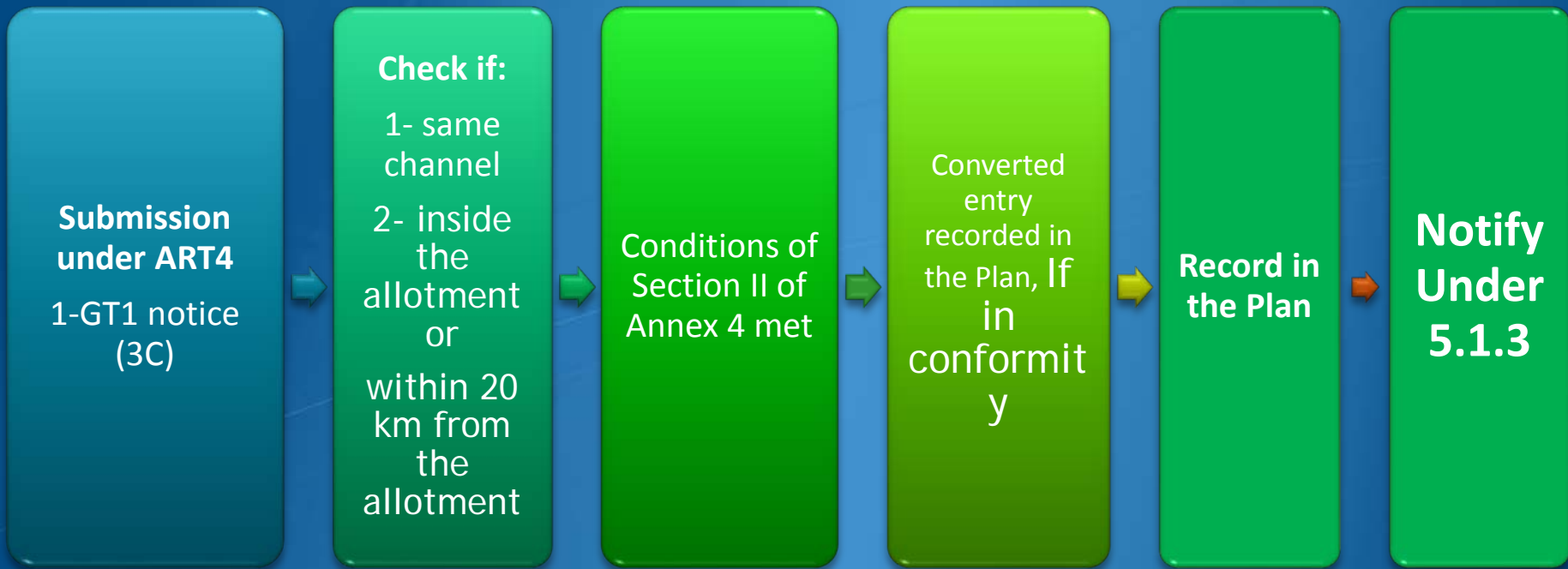
The proposed notified assignment if successfully recorded in the Master Register (MIFR) with a favorable finding **shall not** claim more protection than that afforded to the digital Plan entry.

Notification according to 5.1.3

Rules of Procedures - Partie A10



Notification of a DVB-T2 assignment stemming from a DVB-T allotment



How to notify

- Notices **G02/GB1** must have:
 - *t_pwr_dens* : **Maximum power density** (dB(W/Hz)) averaged over the **worst 4 kHz** calculated for the maximum effective radiated power.
 - *t_emi_cls* : The **class of emission** of the assignment under treatment.
 - *t_bdwidth* : The **necessary bandwidth** of the system to be implemented (kHz)
 - Circular letter CR/286

GOOD NEWS

DVB-T2 variants compatible with GE06

- The 7 and 8 MHz variants of the system are compatible with the GE06 Agreement with respect to spectrum usage.
- The 1.7 MHz variant is compatible with T-DAB frequency planning.
(ITU-R Recommendation BT.1877).
- The DVB-T2 implementation should apply the same level of filtering as that of the Plan entry to ensure that the out-of-band emissions are limited to the same level.

GE06 compatible 7 MHz channel DVB-T2 variants

Modulation	FFT size	Code rate*	Guard interval
QPSK or 16-QAM or 64-QAM or 256-QAM	2k	1/2, 3/5, 2/3, 3/4, 4/5, 5/6	1/32, 1/16, 1/8, 1/4
	4k	1/2, 3/5, 2/3, 3/4, 4/5, 5/6	1/32, 1/16, 1/8, 1/4
	8k	1/2, 3/5, 2/3, 3/4, 4/5, 5/6	1/128, 1/32, 1/16, 19/256, 1/8, 19/128, 1/4
	16k	1/2, 3/5, 2/3, 3/4, 4/5, 5/6	1/128, 1/32, 1/16, 19/256, 1/8, 19/128, 1/4
	32k	1/2, 3/5, 2/3, 3/4, 4/5, 5/6	1/128, 1/32, 1/16, 19/256, 1/8, 19/128

* For block sizes of 16 200 and 64 800 bits

GE06 compatible 8 MHz channel DVB-T2 variants

Modulation	FFT size	Code rate*	Guard interval
QPSK or 16-QAM or 64-QAM or 256-QAM	2k	1/2, 3/5, 2/3, 3/4, 4/5, 5/6	1/32, 1/16, 1/8, 1/4
	4k	1/2, 3/5, 2/3, 3/4, 4/5, 5/6	1/32, 1/16, 1/8, 1/4
	8k	1/2, 3/5, 2/3, 3/4, 4/5, 5/6	1/128, 1/32, 1/16, 19/256, 1/8, 19/128, 1/4
	16k	1/2, 3/5, 2/3, 3/4, 4/5, 5/6	1/128, 1/32, 1/16, 19/256, 1/8, 19/128, 1/4
	32k	1/2, 3/5, 2/3, 3/4, 4/5, 5/6	1/128, 1/32, 1/16, 19/256, 1/8, 19/128
	8k extended	1/2, 3/5, 2/3, 3/4, 4/5, 5/6	1/128, 1/32, 1/16, 19/256, 1/8, 19/128, 1/4
	16k extended	1/2, 3/5, 2/3, 3/4, 4/5, 5/6	1/128, 1/32, 1/16, 19/256, 1/8, 19/128, 1/4
	32k extended	1/2, 3/5, 2/3, 3/4, 4/5, 5/6	1/128, 1/32, 1/16, 19/256, 1/8, 19/128

* For block sizes of 16 200 and 64 800 bits

GE06 compatible 1.7 MHz block DVB-T2 variants

Modulation	FFT size	Code rate*	Guard interval
QPSK or 16-QAM or 64-QAM or 256-QAM	1K	1/2, 3/5, 2/3, 3/4, 4/5, 5/6	1/16, 1/8, 1/4
	2k	1/2, 3/5, 2/3, 3/4, 4/5, 5/6	1/32, 1/16, 1/8, 1/4
	4k	1/2, 3/5, 2/3, 3/4, 4/5, 5/6	1/32, 1/16, 1/8, 1/4
	8k	1/2, 3/5, 2/3, 3/4, 4/5, 5/6	1/128, 1/32, 1/16, 19/256, 1/8, 19/128, 1/4

* For block sizes of 16 200 and 64 800 bits

DVB-T2 variants not compatible with GE6

- The DVB-T2 7 MHz extended carrier modes are not compatible with a DVB-T 7 MHz Plan entry if the required occupied bandwidth is compared with the GE06 DVB-T spectrum mask for 7 MHz.
- Similarly, the variants with a 1k FFT for 7 and 8 MHz channels would be affected in a similar manner if the relevant filter GE06 DVB-T mask is applied.
- DVB-T2 variants for 5 and 6 MHz channel arrangements may also be considered for the implementation of a GE06 Plan entry if suitable filtering is applied, however variants for these channel arrangements do not yet have defined spectrum shaping limits in the ETSI specification [EN 302 755] or in ITU-R Rec. BT.1877 [BT1877].

Conclusions on 5.1.3

- Normally under 5.1.3, to be compatible:
 - The DVB-T2 carrier modes can be using equivalent or higher FFT, but not lower!
 - For protection: use a protection ratio less or equal, and the minimum median FS equal or higher
 - than those relating to the DVB-T mode or RPC recorded in the Plan.

Mobile reception in GE06

- Mobile reception is defined as reception by a receiver in motion with an antenna situated at no less than 1.5m above ground level. This could for example be a car receiver or handheld equipment.
- → DVB-T with mobile reception mode

Mobile digital broadcasting transport mechanisms

Standard or Spec.	Modulation	Transport stream	RF channel (MUX) size (MHz)	Int. Broadcast bands	Regional national origin
DVB-H	QPSK or 16-QAM COFDM	IP/MPE-FEC/ MPEG2 TS	8	IV and V	Region 1 (Europe)
T-DMB*	DQPSK COFDM	MPEG2 TS	1.75	III and 1.5 GHz	Region 3 (Rep. of Korea)
T2-lite	QPSK	H.264	8	IV and V	Region 1 (Europe)

*: Fully compatible with T-DAB

Mobile TV and GE06

- Notification under 5.1.3:
 - T-DMB: plan entry for T-DAB
 - DVB-H: plan entry for DVB-T
 - T2 Lite: plan entry for DVB-T
- Same procedure as for DVB-T2

Thank you for your attention

