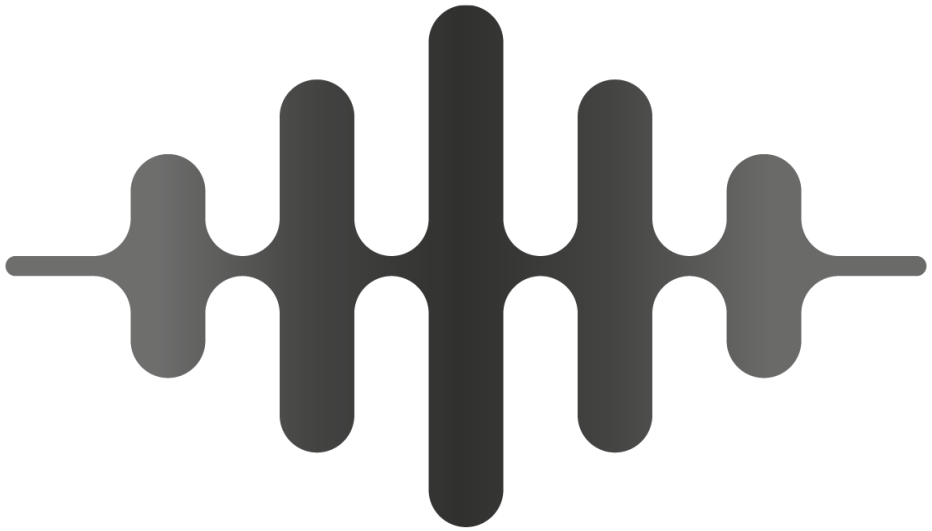

ITUWRS GENEVA2024

2–6 December 2024
Geneva, Switzerland

www.itu.int/wrs-24


ITU World Radiocommunication Seminar

GE06 Agreement for the Primary Terrestrial Services

(excluding broadcasting)

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2. List modification Procedure
3. Proposed modification
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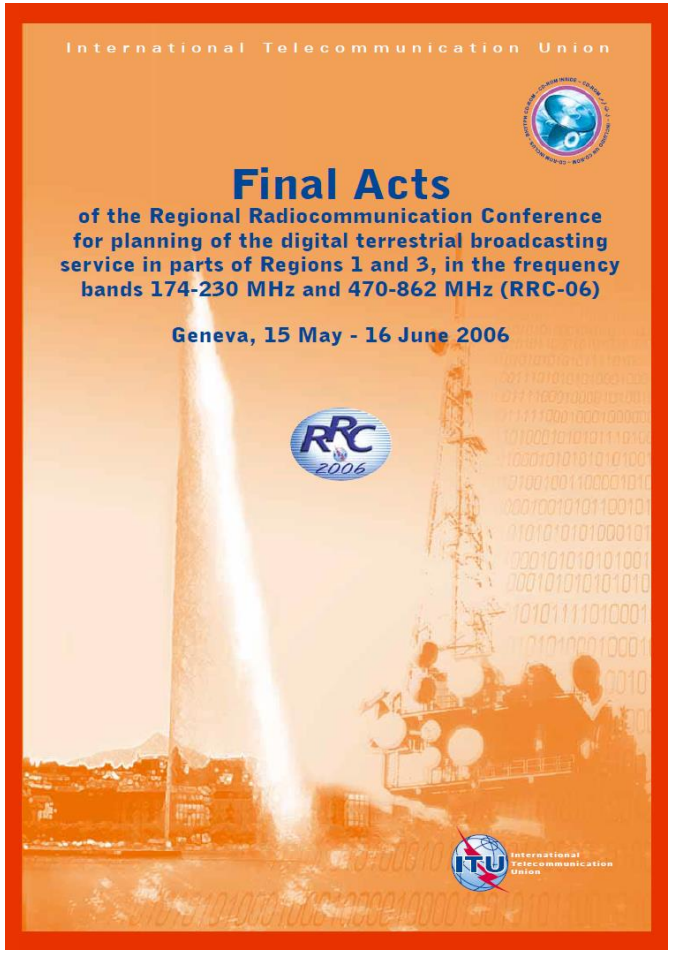


GE06 Agreement

Plan for Digital terrestrial broadcasting

- ✓ For Region 1 countries to west of 170E and to north of 40S excluding MNG and including IRN in Region 3

This Agreement also includes the List of **Other Primary Terrestrial Services (OPTS)** in the frequency bands and area concerned.

Frequency bands, services and area

of OPTS subject to GE06 Agreement

Frequency from (MHz)	Frequency to (MHz)	Service	Countries
174	230	FIXED and MOBILE	IRN
174	223	LAND MOBILE	Countries listed in RR**5.235** (D, AUT, BEL, DNK, FRO, E, CNR, FIN, F, MYT, REU, ISR, I, LIE, MLT, MCO, NOR, HOL, G, ASC, SHN, TRC, GIB, S and SUI)
216	225	AERONAUTICAL RADIONAVIGATION	Countries listed in RR**5.243** (SOM)
223	230	LAND MOBILE	Ctry in RR5.246 (E, CNR, F, F/MYT, F/REU, ISR, MCO)
223	230	AERONAUTICAL RADIONAVIGATION	IRN and Countries listed in RR**5.247** (ARS, BHR, UAE, JOR, OMA, QAT and SYR)
470	862	FIXED and MOBILE	IRN
585	610	RADIONAVIGATION	IRN
614	694	FB, FC, FP, OE, OD, ML, MS	Countries listed in RR**5.307A** (ARS, BHR, EGY, UAE, IRQ, JOR, KWT, OMA, PSE, QAT and SYR)
645	862	AERONAUTICAL RADIONAVIGATION	Countries listed in RR**5.312** (ARM, AZE, BLR, GEO, KAZ, UZB, KGZ, RUS (to west of 170E), TJK, TKM and UKR) *For BUL, 726-753 MHz, 778-811 MHz and 822-852 MHz
694	862	MOBILE except Aeronautical mobile	Region 1 countries to west of 170E and to north of 40S) except MNG
790	862	FIXED	Region 1 countries to west of 170E and to north of 40S) except MNG

List of assignments of OPTS in the Plan

- **Original List** of the frequency assignments to other primary terrestrial services (Annex 5 to the GE 06 Agreement)
  - ✓ in the planning area and bands
  - ✓ https://www.itu.int/en/ITU-R/terrestrial/fmd/Documents/fxm-GE06L-OPS.pdf

174-230 MHz
Total 5 622

adm	stn_cls	cnt
G	FB	2639
G	ML	2784
IRN	FB	186
IRN	FX	13

470-862 MHz
Total 5 388

adm	stn_cls	cnt	adm	stn_cls	cnt	adm	stn_cls	cnt
ARS	FX	101	GEO	AL	7	KGZ	AM	5
ARS	FB	117	IRN	AL	1	MRC	FX	70
ARS	ML	121	IRN	FX	216	RUS	AL	726
AZE	AL	3	IRN	FB	135	RUS	AM	187
BEL	FX	4	ISR	ML	372	RUS	FX	507
CTI	FB	14	JOR	ML	2017	TJK	AL	2
EGY	ML	474	KAZ	AL	9	UAE	FX	4
F	FB	250	KAZ	AM	9	UZB	AL	10
G	AL	5	KGZ	AL	5	UZB	AM	17

List of assignments of OPTS in the Plan

Assignments newly added to the List after 2006

(Total 3 327 for 10 ADMs as of October 2024)

adm	stn_cls	cnt	adm	stn_cls	cnt	adm	stn_cls	cnt	adm	stn_cls	cnt
BLR	FB	648	KAZ	ML	20	RUS	AM	195	UKR	AL	21
EGY	FB	73	LTU	FB	46	RUS	FB	592	UKR	AM	2
EGY	ML	861	LVA	FB	106	RUS	ML	2	UZB	FB	6
EST	FB	37	LVA	ML	1	SWZ	FB	281	UZB	ML	36
KAZ	FB	20	RUS	AL	100	SWZ	ML	280			

Assignments under coordination process

(Total 9 315 for 9 ADMs as of November 2024)

adm	stn_cls	cnt	adm	stn_cls	cnt	adm	stn_cls	cnt	adm	stn_cls	cnt
ARS	FB	264	BLR	FB	7897	LTU	FB	20	UZB	FB	10
ARS	ML	250	EGY	FB	22	POL	FB	12	UZB	ML	12
BHR	FB	5	EGY	ML	452	RUS	FB	125			
BHR	ML	6	EST	FB	72	UAE	FB	168			

Procedure for modification of List

- Flowchart for the modification of the List of frequency assignments Other Primary Service stations in GE06 Agreement
  - ✓ https://www.itu.int/en/ITU-R/terrestrial/fmd/Documents/fxm-GE06-Article4.pdf
- Flowchart for notification of the assignment which has been recorded in the Plan, for recording in MIFR (Mister International Frequency Register)
  - ✓ https://www.itu.int/en/ITU-R/terrestrial/fmd/Documents/fxm-GE06-Article5.pdf

See also ITU Web-page on GE06 Procedure and list

Procedure for modification of List

Proposing ADM	Step	BR	Step	Affected ADM
Proposal for modification of the List of GE06 Agreement	1, 2, 3, 4, 5	Seeks clarification if necessary Returns the notice if incomplete		
Check if the publication is correct	6	Identifies affected ADMs and publish the notice in **Part A of Special Section GE06L** (No. 4.2.2.5, within 40 days from the reception of the notice)	6	Check if any proposed modification is agreeable or not.
		If the request is justified, publishes **addendum to the SS GE06L (Part A)** with the name of affected No. 4.2.3.2, within 30 days from the request)	7, 8, 9, 10, 11, 12	Requests BR to remove/include its name from/in the list of affected ADMs (Nos. 4.2.27 and 4.2.3.1, within 40 days from the date of publication of Part A)

Procedure for modification of List

Proposing ADM	Step	BR	Step	Affected ADM
Check if the coordination information is correct	13, 14	If all required agreements were notified and there has been no request from affected ADMs to remove/include their name from/in the list of affected ADMs, publish the notice in **Part B of SS GE06L** (No. 4.2.2.4, After 40 days from the date of publication of Part A)	13, 14	
		Requests ADMs that have not given their decision (No. 4.2.4.7, After 50 days from the date of publication of Part A)	15	Provides its decision
	16	Informs proposing ADM of the names of agreeing and non-replying ADMs (No. 4.2.4.7, After 75 days from the date of publication of Part A)		

Procedure for modification of List

Proposing ADM	Step	BR	Step	Affected ADM
Requests BR for assistance for reminder (No. 4.2.4.9)	17	Sends a reminder to non-replying ADMs	18	
		Informs proposing ADM of the coordination status (Nos. 4.2.4.9 and 4.2.4.10, After 40 days from the date of reminder)	19	Gives decisions (within 40 days from the date of reminder)
Requests BR for assistance for study (No. 4.2.4.12)	Note 1	Informs the requesting ADM of the study results and possible recommendation (No. 4.2.4.12, within 40 days from the date of request)	Note 1	Requests BR for assistance for study (No. 4.2.4.12)

4.2.4.10 If no decision is communicated to the *Bureau* within 40 days after the date of dispatch of the reminder under § 4.2.4.9, it shall be deemed that the administration which has not given a decision has agreed to the proposed new or modified assignment.

Procedure for modification of List

Proposing ADM	Step	BR	Step	Affected ADM
Sends final characteristics and the names of ADMs having agreed (No. 4.2.5.1, within 24 months and 75 days from the date of publication of Part A)	22, 23, 24, 25, 26, 27	If no information is received, lapse the proposals. (No. 4.2.5.1) If the final characteristics identifies new ADMs as affected, invites the proposing ADM to repeat the same procedure. (No. 4.2.5.2) Otherwise publishes the notice in Part B of SS GE06L (No. 4.2.5.3, Within 30 days from the date of reception of the new characteristics)	27	
Notifies the assignment under Article 5 (No. 4.2.5.4, Within 12 months from the date of publication of Part B)	28, 29, 30	Publishes the notice in **Part I of BR IFIC** Examines the notice under Nos. **11.31** and **11.34** of the Radio Regulations and publish it in **Part II of BR IFIC**. (Nos. 5.2.2 and 5.2.3)		

4.2.5.4 The proposed new or modified assignment shall lapse if it is not notified under Article 5 within 12 months after the publication referred to in § 4.2.5.3.

2. Procedure for modification of List

Proposing ADM	Step	BR	Step	Affected ADM
Resubmits the notice that was returned (No. 5.2.4)	29	Publishes the resubmitted notice in **Part I of BR IFIC** If the notice for resubmission includes a signed **commitment** by the notifying ADM, indicating that use of the assignment shall not cause unacceptable interference to, nor claim protection from, any station of the administration, publishes it in **Part II of BR IFIC** with that **condition**.	29	

Notification procedure

➢Notification for modification of a Plan

Administrations

ITU Radiocommunication Bureau

Creation of Notices (TerRaNotices)

Online Validation

Submission (WISFAT)

Final validation

Publication in BR IFIC Special Section (**Part A**)

Coordination under relevant provisions of Agreement

Publication in BR IFIC Special Section (**Part B**)

Plans

Return to ADM, if unfavorable

Notification procedure

- In the frequency bands governed by a Plan or an Agreement
- Preparation of a notice file using TerRaNotice (BR IFIC DVD)
- Validation of the notices using ITU web-page for validation
- Submission of the notice file through Web Interface for the Submission of Frequency Assignments/Allotments for the Terrestrial Services (WISFAT)
- Publication of the notices in BR IFIC (**Special Section Part A**)
- **Coordination through the BR**
- Publication of the notices in BR IFIC (**Special Section Part B**)

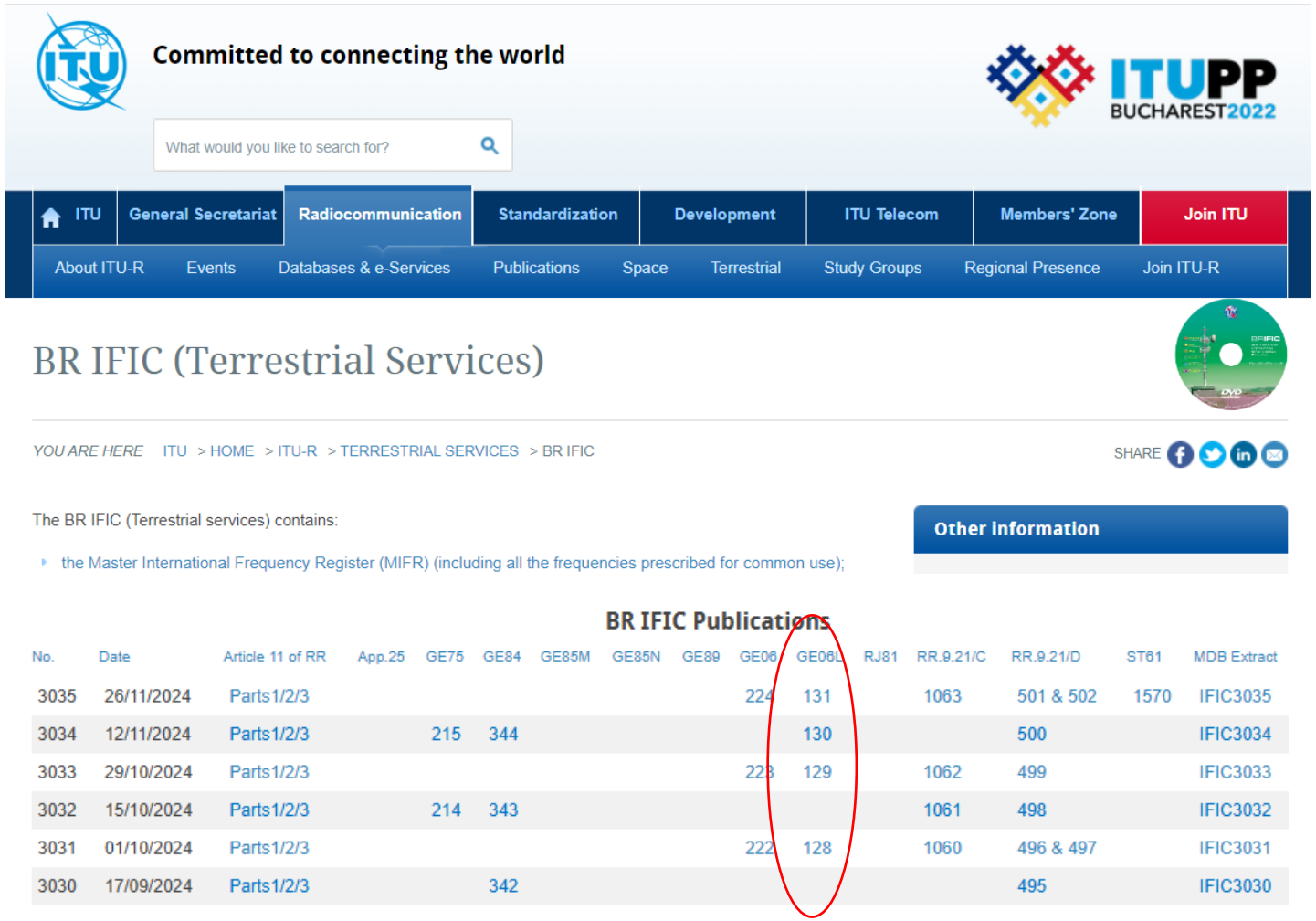
See also ITU Web-page on GE06 Procedure and list

Notification procedure

- Summary of the other primary services in GE 06 Agreement
  - ✓ https://www.itu.int/en/ITU-R/terrestrial/fmd/Documents/fxm-GE06-report.pdf
- Notification Guide
  - ✓ https://www.itu.int/en/ITU-R/terrestrial/tpr/Documents/os_guide.pdf
- Notice forms and Example notices
  - ✓ https://www.itu.int/en/ITU-R/terrestrial/tpr/Pages/FXMNotices.aspx#OSNotices

Notification procedure

- https://www.itu.int/en/ITU-R/terrestrial/brific/Pages/default.aspx
  - ✓ **SS GE06L/131, 129, … for Part A**
  - ✓ **SS GE06L/131, 130, … for Part B**



Coordination Criteria

➢ Protection of Terrestrial Digital TV*

- ✓ For Propagation curves given in GE06 Agreement (Chapter 2 of Annex 2) for 1% of the time and for 50% of locations are used
- ✓ For **air-to-ground**, the free-space model should be used. The coordination contour is limited to a line-of-sight distance of 420 km.
- ✓ In the case of aeronautical services for **airborne stations** the height of the transmitting antenna above the ground is 10 000 m.

No. 5.2.1 of Section I of Annex 4

12.6 The *Transition period* shall end on 17 June 2015 at 0001 hours UTC. However, for the countries listed in footnote below[7], for the band 174-230 MHz[8], the *Transition period* shall end on 17 June 2020 at 0001 hours UTC. After the end of the applicable *Transition period*, the corresponding entries in the analogue Plan shall be cancelled by the *Bureau*, and

Coordination Criteria

➢Coordination trigger field strength to protect DTV

TABLE A.1.10

Coordination trigger field strengths for the protection of the Plan from other primary terrestrial services

Broadcasting system to be protected	Trigger field strength (dB(μV/m))(1)			
	Band III (174 -230 MHz)	Band IV (470-582 MHz)	Band V (582-718 MHz)	Band V (718-862 MHz)
Analogue and digital(2)	10	18	20	22
Digital	17	21	23	25

(1) The trigger field-strength values are related to the 7 or 8 MHz bandwidth of the system to be protected.

(2) To be applicable during the transition period.

Appendix 1 to Section I of Annex 4

Coordination Criteria

➢ Protection of other primary terrestrial services

- ✓ Reference broadcasting station is used
- ✓ total maximum radiated power 53 dBW.
- ✓ maximum effective antenna height 600 m and mixed polarization.
- ✓ The maximum coordination distance for **aircraft receivers** is set at 500 km.
- ✓ Calculate from 1000 km reference point with 10 km steps, until the field strength is below the **required threshold** for the receiving station.

No. 5.2.2 of Section I of Annex 4

Coordination Criteria

- Protection of other primary terrestrial services (Mobile Service)

TABLE A.1.3

Coordination trigger field-strength values to protect systems of the mobile service from DVB-T

System to be protected	System type code (see Annex 2, Chapter 4)	Frequency range	Trigger field strength (dB(µV/m))(1)	Height of the receiving antenna (m)
Analogue private mobile radio, 12.5 kHz	NV	Band III	30 (base stations) 38 (mobile stations)	20 (base station) 1.5 (mobile station)
Land mobile system NR (radio microphone)	NR	790-862 MHz/Band III	58 (UHF)/50 (VHF)	1.5
Mobile system NS (OB link, stereo, non-companded)	NS	790-862 MHz/Band III	45 (UHF)/37 (VHF)	10
Mobile system NT (Talk-back)	NT	790-862 MHz/Band III	47 (UHF)/39 (VHF)	1.5

Appendix 1 to Section I of Annex 4

Coordination Criteria

- Protection of other primary terrestrial services (Mobile Service)

TABLE A.1.3 (*end*)

System to be protected	System type code (see Annex 2, Chapter 4)	Frequency range	Trigger field strength (dB(μV/m))(1)	Height of the receiving antenna (m)
Digital land mobile system NA (e.g. CDMA)	NA	470-862 in Region 3, 790-862 MHz in accordance with RR No. 5.316	18 (base station)	20 (base station)
Generic mobile system NB	NB	174-230 MHz/ 470-862 MHz	See equation (A.1.1) and Table A.1.4 (base station) See equation (A.1.1) and Table A.1.5 (mobile station)	20.0 (base station) 1.5 (mobile station)
Land mobile system XN (VHF)	XN	Band III	38	1.5
Land mobile system YN (480 MHz)	YN	480 MHz	41	1.5
Land mobile system ZC (620 MHz)	ZC	620 MHz	43	1.5

(1) The trigger field-strength values are related to the DVB-T bandwidth.

Appendix 1 to Section I of Annex 4

Coordination Criteria

- Protection of other primary terrestrial services (Mobile Service)

For the generic case (type code NB) in the mobile service, i.e. when there is no value of protection ratio available, the following equation must be used:

$$F_{trigger} = -37 + F - G_i + L_F + 10 \log(B_i) + P_o + 20 \log f + I/N \qquad \text{(A.1.1)}$$

where:

F: receiver noise figure of the mobile service base or mobile station receivers (dB)

B_i: the bandwidth of the terrestrial broadcasting station (MHz)

G_i: the receiver antenna gain of the station in the mobile service (dBi)

L_F: antenna cable feeder loss (dB)

f: centre frequency of the interfering station (MHz)

P_o: man-made noise (dB) (typical value is 1 dB for the VHF band and 0 dB for the UHF band)

I/N: interference to noise ratio, which must not exceed the threshold (margin) applicable when developing the Plan ($I/N = -6$ dB).

Appendix 1 to Section I of Annex 4

Coordination Criteria

- Protection of other primary terrestrial services (MS)

TABLE A.1.4

Typical values of the parameters when applying equation (A.1.1) to derive coordination trigger field-strength values to protect the base stations for the generic case (type code NB) of the mobile service from DVB-T

Frequency (MHz)	174	230	470	790	862
F (dB)	8	8	4	3	3
G_i (dBi)	6	8	12	17	17
L_F (dB)	2	2	2	4	4
P_o (dB)	1	1	0	0	0
$F - G_i + L_F + P_o$	5	3	–6	–10	–10

TABLE A.1.5

Typical values of the parameters when applying equation (A.1.1) to derive coordination trigger field-strength values to protect the mobile stations for the generic case (type code NB) of the mobile service from DVB-T

Frequency (MHz)	174	230	470	790	862
F (dB)	11	11	7	7	7
G_i (dBi)	0	0	0	0	0
L_F (dB)	0	0	0	0	0
P_o (dB)	1	1	0	0	0
$F - G_i + L_F + P_o$	12	12	7	7	7

Appendix 1 to Section I of Annex 4

Coordination Criteria

Protection of other primary terrestrial services (MS)

- Trigger field strengths of an IMT station operating on 790 MHz are
  - 17 dB(μV/m) for a receiving base station
  - 36 dB(μV/m) for a receiving mobile station,

The parameters to be applied in the equation are listed below. They are derived from Report ITU-R M.2039-3 for IMT-2000 systems and Report ITU-R M.2292-0 for IMT-Advanced systems.

Parameters	Receiving base station (ML)	Receiving mobile station (FB)
f (centre frequency, MHz)	470-862	
F (receiver noise figure, dB)	5	9
G_i (receiver antenna gain, dBi)	15	–3
L_F (antenna cable feeder loss, dB)	3	0
P_o (man-made noise, dB)	0	0
I/N (interference to noise ratio, dB)	–6	
B_i (bandwidth of TV station, MHz)	8	

The above parameters apply to stations operating on frequency 790 MHz. For other frequencies in the UHF band, the interpolation should be made by adding a correction factor of 10 log (f/790).

Rules of Procedure A10 (Appendix 1 to Section I)

Practical consideration

➢ Example for receiving base station

BR ID: 122046472
Administration: BHR
Administration's unique ID: MUHARRAQ_705.5
Fragment: GE06L
Provision: GE06-4.2
Notice type: **G13** / ADD
Date Rcv: 20 Apr 2022
Date In Use: 06 Dec 2021
Stage: COORD
Publication history: GE06L/A/82

Assigned frequency: **705.5 MHz**
Bandwidth: **5M00**
Examination category: L06
System type(s): **NA**
Class of station: **ML**
Geographic area: BHR
Site name: 1
Coordinates: 50°32'16"E - 26°9'34"N
Coordinates: 50.5378° ; 26.1594°

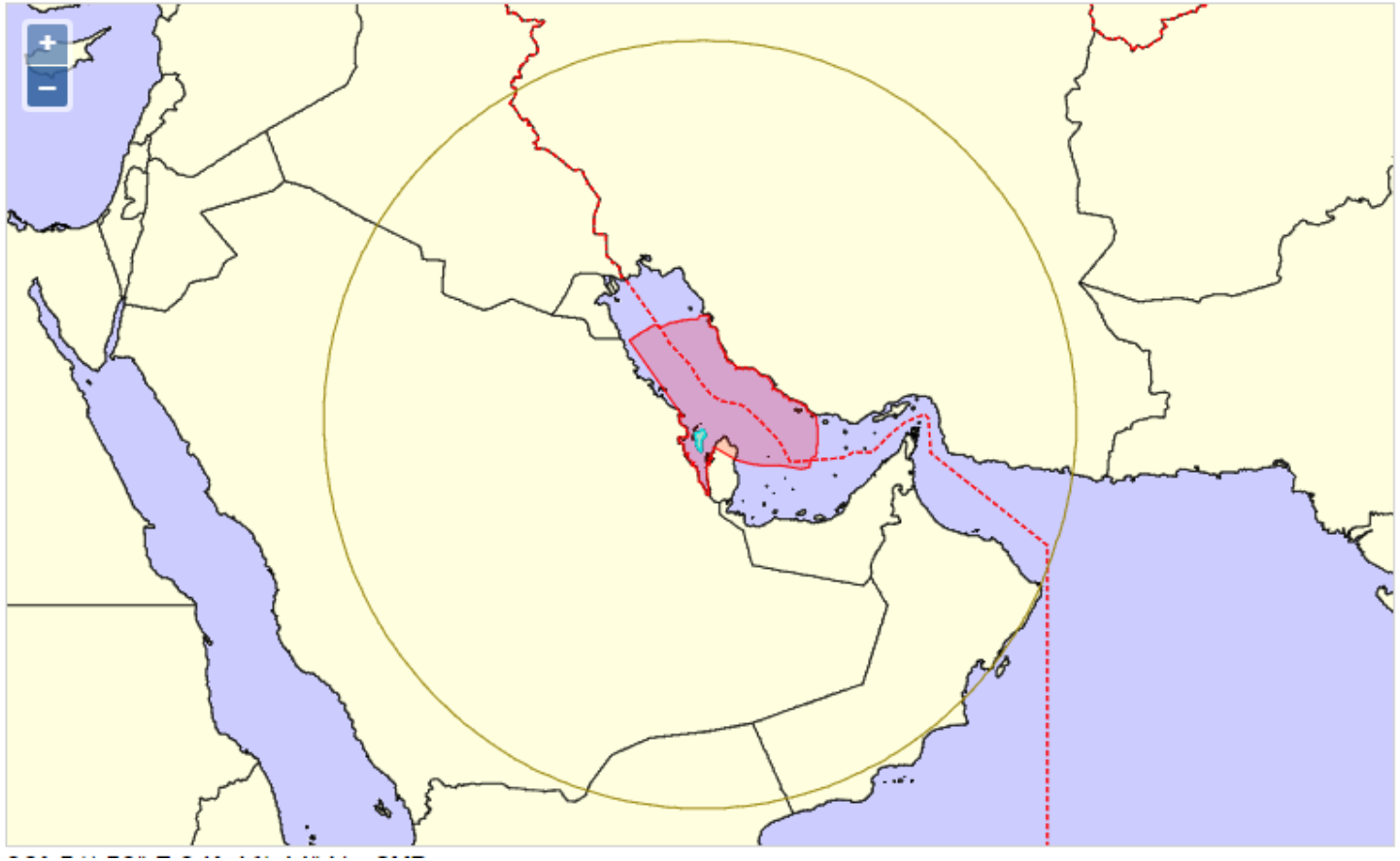
Practical consideration

➢ Example for receiving base station

Calculation parameters for FXM TX sites	Calculation parameters for FXM RX sites
ERP: -6 dBW	Vertical ERP: **50 dBW**
	Horizontal ERP: **50 dBW**
Polarization: U	Polarization: M
Height above ground level: 1.5 m	Height above ground level: **600 m**
Site altitude: 1 m	Site altitude: 1 m
Receiver type: Fixed broadcasting	Receiver type: Terrestrial (not airborne) OS
Polar. discrimination: 16 dB	Polar. discrimination: 16 dB
Percentage of time: **1%**	Percentage of time: **10%**
Percentage of location: 50%	Percentage of location: 50%
Trigger field strength: **23 dB(uV/m)**	Trigger field strength: **18 dB(uV/m)**
Receiver antenna height: 10 m	Receiver antenna height: 0 m

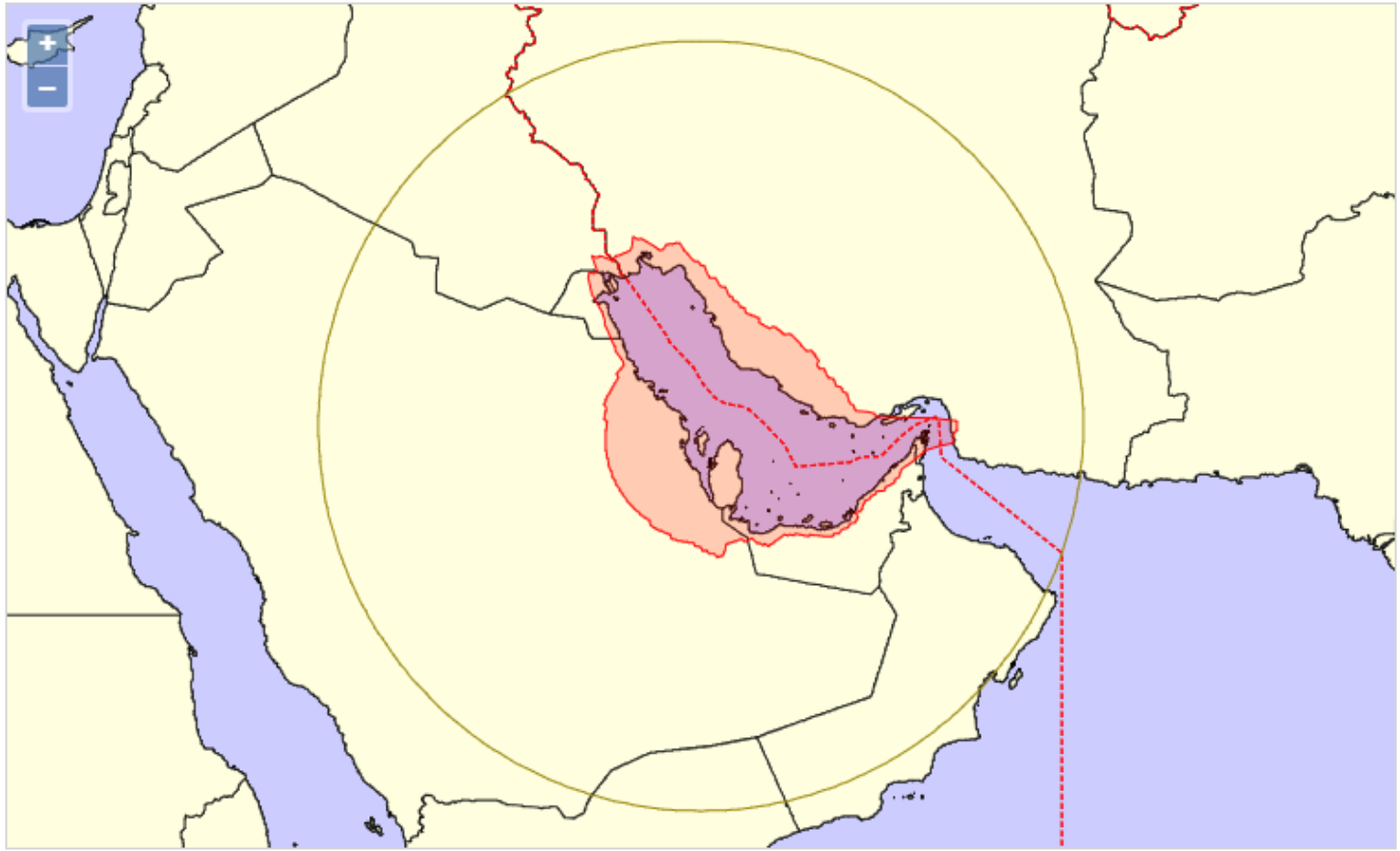
Practical consideration

- Example for receiving base station
  - ✓ Administrations intersecting the 1000km contour: ARS, IRN, IRQ, KWT, OMA, QAT, UAE, YEM
  - ✓ Geographical areas intersecting the coordination contour of TX: ARS, IRN, QAT



Practical consideration

- Example for receiving base station
  - ✓ Geographical areas intersecting the coordination contour of RX: ARS, IRN, IRQ, KWT, OMA, QAT, UAE
  - ✓ Administrations identified as affected: ARS, IRN, IRQ, KWT, OMA, QAT, UAE



Practical consideration

➢ Example for Transmitting base station

BR ID: 122046478
Administration: BHR
Administration's unique ID: MUHARRAQ_760.5
Fragment: GE06L
Provision: GE06-4.2
Notice type: **G12** / ADD
Date Rcv: 20 Apr 2022
Date In Use: 06 Dec 2021
Stage: COORD
Publication history: GE06L/A/82

Assigned frequency: **760.5 MHz**
Bandwidth: **5M00**
Examination category: L06
System type(s): **NA**
Class of station: **FB**
Geographic area: BHR
Site name: BHR
Coordinates: 50°32'10"E - 26°9'26"N
Coordinates: 50.5361° ; 26.1572°

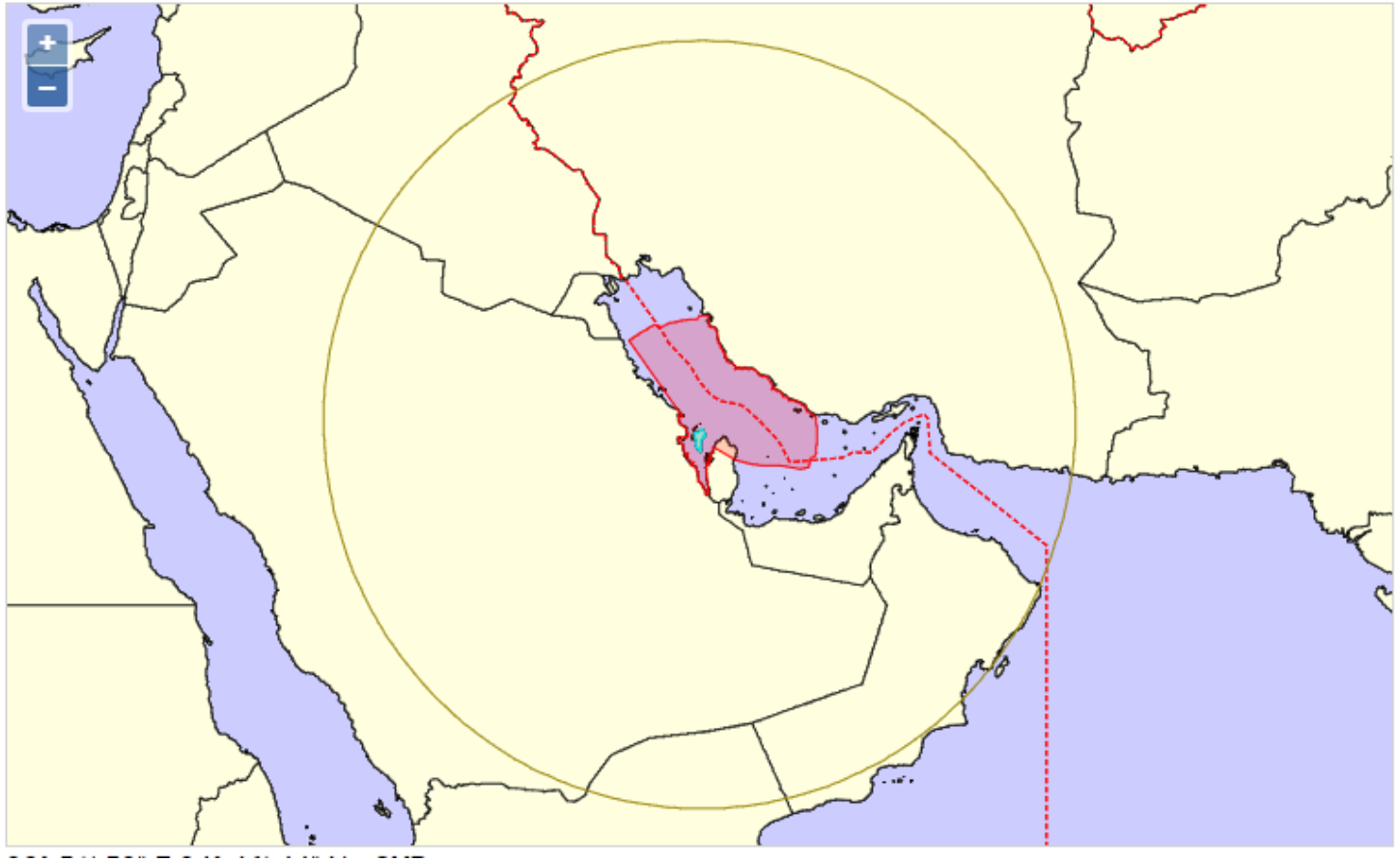
Practical consideration

➢ Example for Transmitting base station

Calculation parameters for FXM TX sites	Calculation parameters for FXM RX sites
ERP: 16 dBW	**Vertical ERP:** 50 dBW
	Horizontal ERP: 50 dBW
Polarization: V	**Polarization:** M
Height above ground level: 92 m	**Height above ground level: 600 m**
Site altitude: 0 m	**Site altitude:** 1 m
Receiver type: Fixed broadcasting	**Receiver type:** Terrestrial (not airborne) OS
Polar. discrimination: 16 dB	**Polar. discrimination:** 0 dB
Percentage of time: 1%	**Percentage of time: 10%**
Percentage of location: 50%	**Percentage of location:** 50%
Trigger field strength: 25 dB(uV/m)	**Trigger field strength: 18 dB(uV/m)**
Receiver antenna height: 10 m	**Receiver antenna height: 20 m**

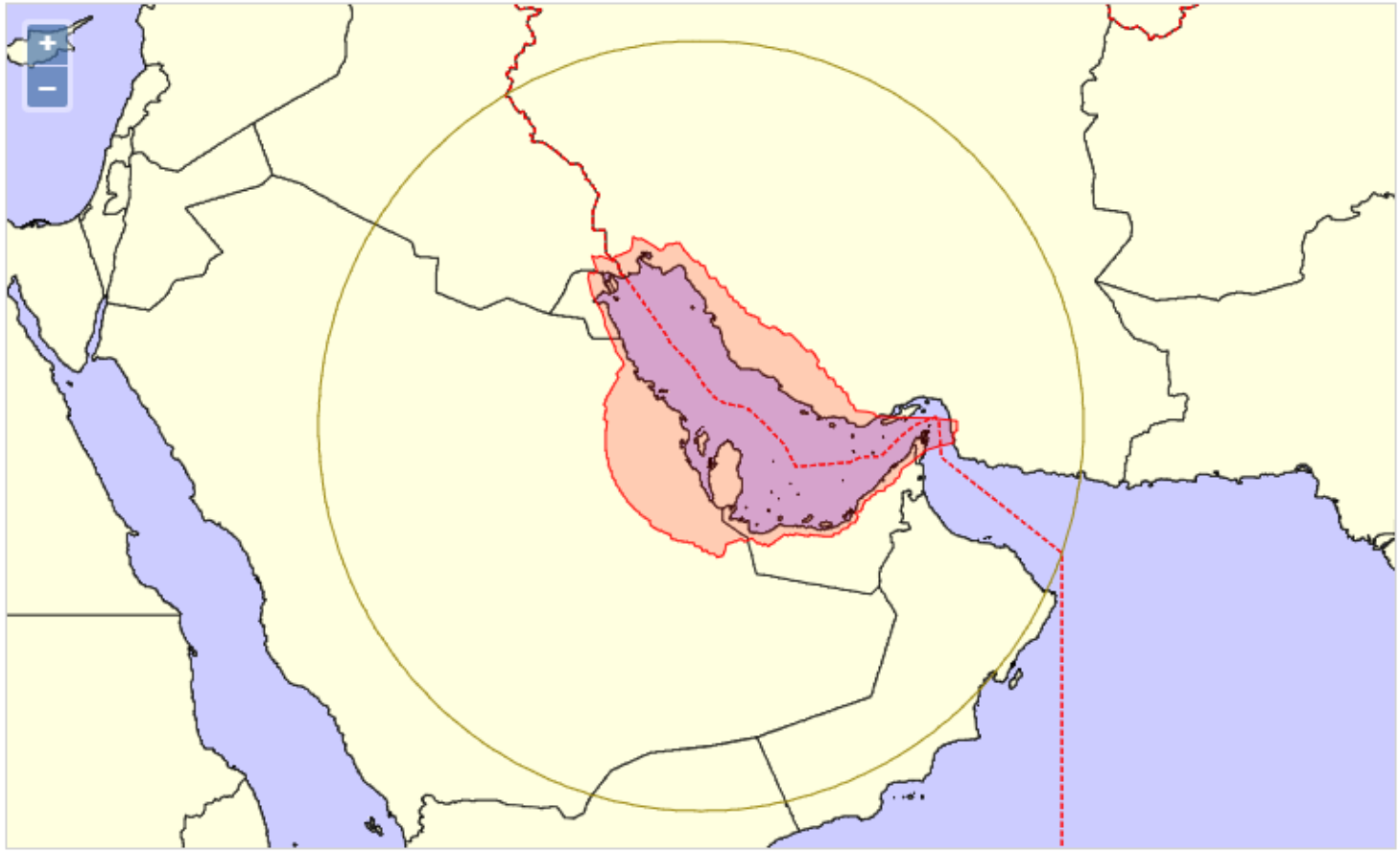
Practical consideration

- Example for transmitting base station
  - ✓ Administrations intersecting the 1000km contour: ARS, IRN, IRQ, KWT, OMA, QAT, UAE, YEM
  - ✓ Geographical areas intersecting the coordination contour of **TX**: ARS, IRN, IRQ, KWT, OMA, QAT, UAE



Practical consideration

- Example for receiving land mobile station
  - ✓ Geographical areas intersecting the coordination contour of **RX**: ARS, IRN, IRQ, KWT, OMA, QAT, UAE
  - ✓ Administrations identified as affected: ARS, IRN, IRQ, KWT, OMA, QAT, UA



Practical consideration

➢ Specific cases

✓ Cases where RR **9.21** coordination procedure should be precedent for the allocation is activated

RR No.	Freq. Band	Service	Coordination criteria	Area
5.307A	614-694 MHz (IMT)	MOBILE except aeronautical mobile	RoP Part B Section B6	Countries listed in RR**5.307A** (ARS, BHR, EGY, UAE, IRQ, JOR, KWT, OMA, PSE, QAT and SYR)
5.312A	694-790 MHz		RoP 5.312A Res. **760 (Rev.WRC-23)**	XR1 countries within 450 km from countries listed in No. **5.312** (ARM, AZE, BLR, BUL, GEO, KAZ, KGZ, RUS, TJK, TKM, UKR, UZB):
5.316B	790-862 MHz		RoP 5.316B Res. **749 (Rev.WRC-23)**	ALB, ARM, AUT, AZE, BIH, BLR, BUL, CZE, D, DNK, EST, FIN, GEO, GRC, HNG, HRV, I, IRQ, KAZ, KGZ, LTU, LVA, MKD, MDA, MNE, MNG, NOR, POL, ROU, RUS, S, SRB, SVK, SYR, TJK, TKM, TUR, UKR and UZB

Concluding remarks

- GE06 Agreement is not only for DTV Plan but also for Other Primary Terrestrial Services
  - ✓ It is important to note that the frequency assignments recorded in the Plan have the right to international recognition
- For proposing ADMs,
  - ✓ It is critical to provide BR with name of the agreed ADMs within 24 months + 75 days
  - ✓ It is also important to notify under Article **11** of the RR the assignments which have published in Part B of SS GE06L, within 12 months (If not, they are lapsed.)
  - ✓ In some countries, it is important to apply RR**9.21** coordination procedure together with GE06L modification procedure
- For affected ADMs,
  - ✓ It is critical to reply to the reminder within 40 days (If not, it is considered as agreed)

Thank you!

ITU – Radiocommunication Bureau

Questions to brmail@itu.int or brfmd@itu.int