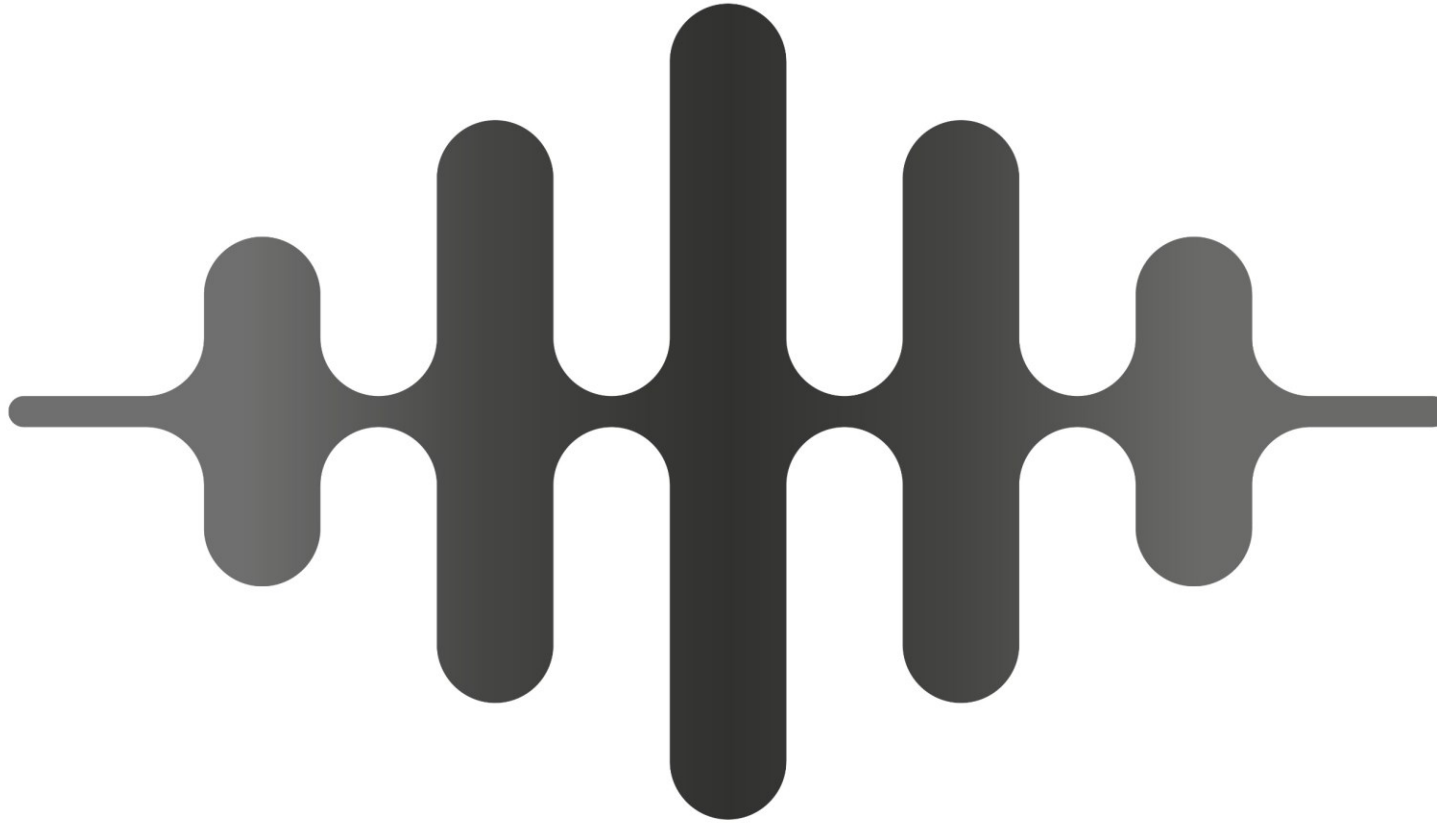
32ND ITU WORLD
RADIOCOMMUNICATION SEMINAR

ITUWRS
GENEVA2026

7–11 December 2026
Geneva, Switzerland

itu.int/go/ITU-R/WRS-26
#ITUWRS



Organized by:

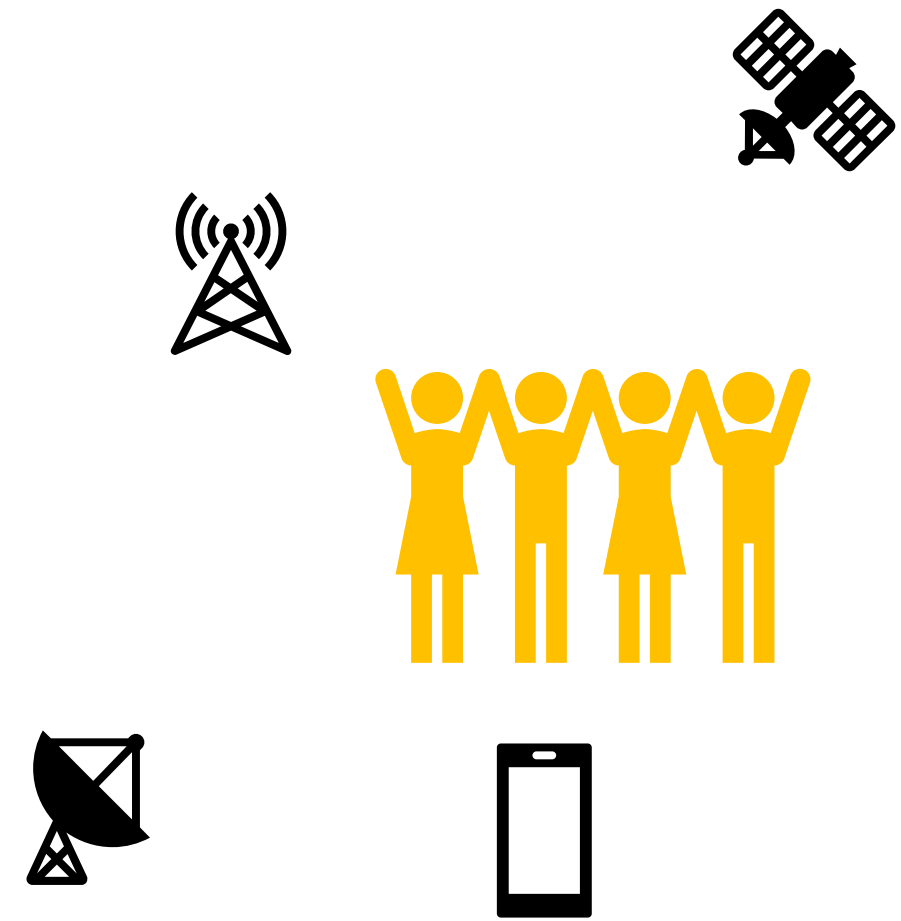
ITU World Radiocommunication Seminar 2026



Coordination under No. 9.21 of the RR for Terrestrial Services (FXM)

Contents

1. Introduction
2. Frequency bands
3. Coordination Procedure
4. Coordination criteria
5. Propagation models
6. Practical considerations
7. Coordination examples



Radio Regulations

Articles

Edition of 2024

1

ARTICLE 9

Procedure for effecting coordination with or obtaining agreement of other administrations[1, 2, 3, 4, 5, 6, 7, 8] (WRC-19)



Exercise 1

When does the coordination under provision No. 9.21 apply?

Solution 1

- **9.6** Before an administration notifies to the Bureau or brings into use a frequency assignment in any of the cases listed below, it shall effect coordination, as required, with other administrations identified under No. **9.27**: (WRC-03)

- **9.21** *p)* for any station of a service for which the requirement to seek the agreement of other administrations is included in a footnote to the Table of Frequency Allocations referring to this provision. (WRC-2000)

Exercise 2

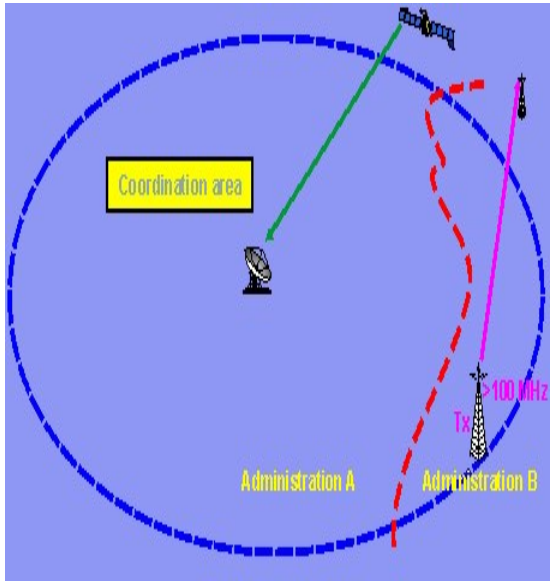
Please identify the different points between coordination under No. **9.21** and Nos. **9.18** and **9.19** in general.

Solution 2

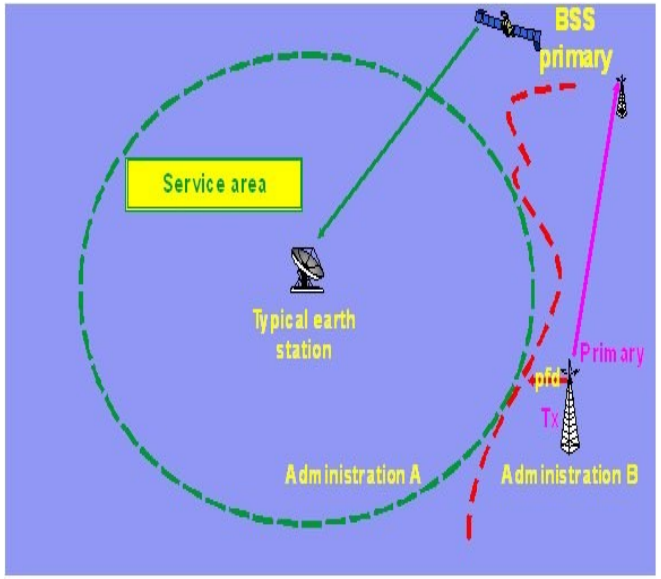
- The service to be **protected**
  - ✓ For No. **9.18** coordination, it is a satellite service(receiving earth station)
  - ✓ For No. **9.19** coordination, it is BSS (service area)
  - ✓ For No. **9.21** coordination, it is any service to which the frequency band is allocated on an equal or higher status with the notified frequency assignment.

See also ITU Web-page on coordination

Solution 2 (2)



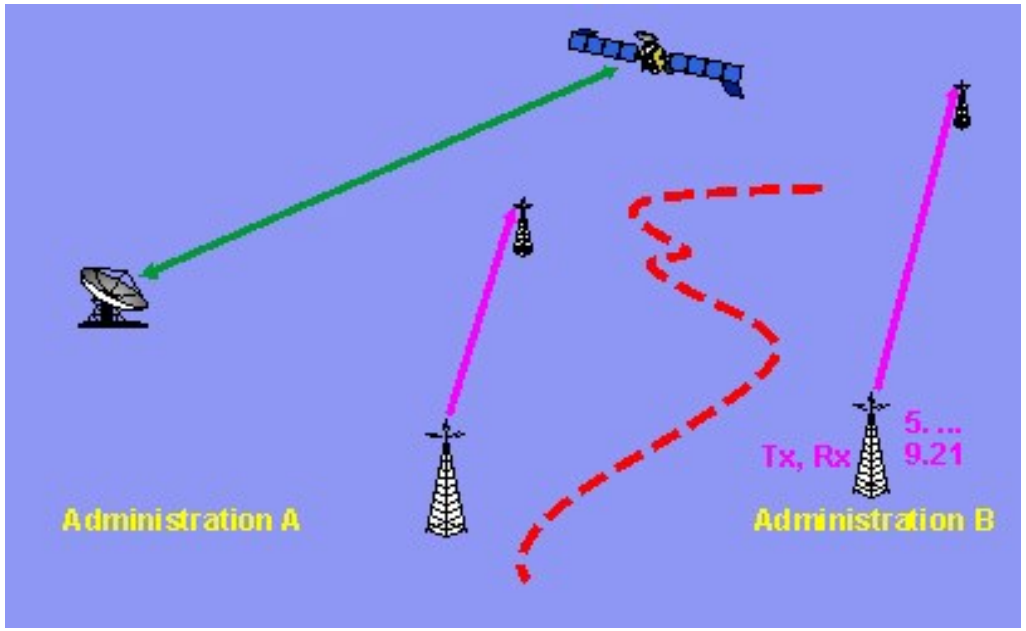
RR 9.18 coordination



RR 9.19 coordination

See also ITU Web-page

RR 9.21 coordination



Solution 2 (3)

- For No. **9.18** coordination and No. **9.19** coordination,
  - ✓ the notifying administration should **identify** potentially affected administrations and **send** the request for coordination **directly** to the identified administrations to effect the coordination **without BR's involvement**
- For No. **9.21** coordination,
  - ✓ the notifying Administration should **send** its request for coordination to **the BR** to effect the coordination. The **BR identifies** the potentially affected administrations and inform them of the request.

Exercise 3

Please identify which footnotes are referring to No. **9.21**.

Which ones are for allocation to the services and which ones are for identification of IMT?

Solution 3

- RR contains 52 footnotes for TS referring to No. **9.21**
  - ✓ For FXM allocation: RR Nos. **5.61**, **5.87A**, **5.92**, **5.93**, **5.181**, **5.190**, **5.197**, **5.225A**, **5.251**, **5.259**, **5.292**, **5.293**, **5.295A**, **5.297**, **5.307A**, **5.308**, **5.309**, **5.312A**, **5.316B**, **5.323**, **5.325**, **5.326**, **5.410**, **5.430A**, **5.431A**, **5.432B**, **5.434A, 5.447**, **5.480A**, **5.431B**, **5.431E**, **5.434A** and **5.482**
  - ✓ For BS allocation: RR Nos. **5.123**, **5.177**, **5.252** and **5.322**
  - ✓ For IMT identification: RR Nos. **5.295**, **5.296A**, **5.308A**, **5.341A**, **5.341C**, **5.346**, **5.346A**, **5.431B**, **5.441B**, **5.457F**, **5.531B, 5.531E** and **5.553A**
  - ✓ For HIBS identification: RR Nos. **5.312B** and **5.314A**
  - ✓ Most of the footnotes are intended to **allocate** a frequency bands, however some of them are to **identify** the frequency bands for **IMT** or **HIBS**.

Exercise 4

- Please explain what disadvantages are expected, if an ADM does not initiate coordination for the services mentioned in the footnotes listed in Solution 3.

Solution 4

- If an ADM does not effect coordination in the frequency bands allocated subject to coordination under No. **9.21**,
  - ✓ It is considered as there is **no allocation** at all in its country;
  - ✓ Any assignments for the service subject to coordination under No. **9.21** could **not** get a **favorable** findings in the examination with respect to No. **11.31**; and
  - ✓ They have **no right to international recognition** stipulated by No. **8.3**.

8.3 Any frequency assignment recorded in the Master Register with a favourable finding under No. **11.31** shall have the right to international recognition. For such an assignment, this right means that other administrations shall take it into account when making their own assignments, in order to avoid harmful interference. In addition, frequency assignments in frequency bands subject to coordination or to a plan shall have a status derived from the application of the procedures relating to the coordination or associated with the plan.

Exercise 5

From the frequency table in the following slides,

1. Please find the frequency bands allocated to the terrestrial services in your country.
2. Please find the frequency bands identified for IMT in your country.

Solution 5

➢ Frequency, service, area and coordination criteria

RR No.	Freq. band	Service	Coordination criteria	Area *
5.61	70-90 kHz 110-130 kHz	MARITIME RADIONAVIGATION	RoP B4	XR2
5.87A	526.5-1606.5 kHz	RADIONAVIGATION	RoP B4	UZB
5.92	1606.5-1625 kHz 1635-1800 kHz 1850-2160 kHz 2194-2300 kHz 2502-2850 kHz 3500-3800 kHz	RADIODETERMINATION	RoP B5	XR1
5.93	1 625-1 635 kHz 1 800-1 810 kHz 2 160-2 170 kHz	FIXED LAND MOBILE	RoP B4	ARM, AZE, BLR, GEO, HNG, KAZ, KGZ, LVA, LTU, MNG, NIG, POL, SVK, RUS, TJK, TCD, TKM, UKR, UZB
5.123	3 900-3 950 kHz	BROADCASTING	RoP B4	AFS, MRN, BOT, LSO, MOZ, MWI, NMB, SWZ, ZMB, ZWE
5.177	73-74 MHz	BROADCASTING	Recs. ITU-R SM.851 and ITU-R BS.412	ARM, AZE, BLR, GEO, KAZ, KGZ, RUS, TJK, TKM, UKR, UZB

Region 2

** The areas in Region 2 are highlighted with green, in Region 3 with blue and in Region 1 without highlight.*

Solution 5 (2)

Return to the first band.

➢ Frequency, service, area and coord. criteria

RR No.	Freq. band	Service	Coordination criteria	Area *
5.181	74.8-75.2 MHz	Mobile	Not available yet	EGY, ISR, SYR
5.190	87.5-88 MHz	LAND MOBILE	Not available yet	MCO
5.197	108-111.975 MHz	Mobile	Not available yet	SYR
5.225A	154-156 MHz	RADIOLOCATION	No. **5.225A**	ALG, ARM, AZE, BLR, CHN, HKG, MAC, XGN, F, CRO, MYT, REU, IRN, KAZ, KGZ, RUS, TJK, TKM, UKR, UZB, VTN
5.251	230-235 MHz	AERONAUTICAL RADIONAVIGATION	Not available yet	NIG
5.252	230-238 MHz 246-254 MHz	BROADCASTING	Rec. ITU-R SM.851	AFS, MRN, BOT, LSO, MWI, MOZ, NMB, SWZ, ZMB, ZWE
5.259	328.6-335.4 MHz	Mobile	Not available yet	EGY, SYR
5.279	430-435 MHz 438-440 MHz	Fixed MOBILE except aero.	Not available yet	MEX
5.292	470-512 MHz	MOBILE	RoP B6	ARG, URG, VEN

** The areas in Region 2 are highlighted with green, in Region 3 with blue and in Region 1 without highlight.*

Solution 5 (2)

Return to the first band.

➢ Frequency, service, area and coord. criteria

RR No.	Freq. band	Service	Coordination criteria	Area *
5.293	470-512 MHz	MOBILE	RoP B6	ARG, BAH, BRB, CAN, CHL, CUB, EQA, GUY, JMC, MEX, PNR, USA, ALS, HWA, JON, MDW, PAQ, PTR, VIR
	470-512 MHz	FIXED		ARG, CAN, CHL, CUB, EQA, GUY, PNR, USA, ALS, HWA, JON, MDW, PAQ, PTR, VIR
	614-698 MHz	MOBILE		BAH, BRB, CAN, CHL, CUB, GUY, MEX, PNR, USA, ALS, HWA, JON, MDW, PAQ, PTR, VIR
	614-806 MHz	FIXED		CAN, CHL, CUB, GUY, PNR, USA, ALS, HWA, JON, MDW, PAQ, PTR, VIR
5.295	470-608 MHz	LAND MOBILE (IMT)	Covered by **5.293** & **5.297**	BAH, BRB, CAN, MEX, USA, ALS, HWA, JON, MDW, PTR, VIR
5.295A	470-694 MHz	Mobile, except aeronautical mobile	RoP B6	ALB, AND, AUT, BEL, BIH, BUL, CVA, CYP, CZE, D, DNK, EST, F, CRO, MYT, REU, FIN, G, ASC, GCA, GIB, SHN, TRC, GEO, GRC, HNG, HOL, HRV, IRL, ISL, LIE, LTU, LUX, LVA, MCO, MDA, MKD, MLT, MNE, NOR, BVT, POL, POR, ROU, S, SMR, SRB, SUI, SVK, SVN, TUR, UKR, UZB

** The areas in Region 2 are highlighted with light green, in Region 3 with sky blue and in Region 1 without highlight.*

Solution 5 (4)

Return to the first band.

➢ Frequency, service, area and coord. criteria

RR No.	Freq. band	Service	Coordination criteria	Area *
5.296A	470-698 MHz / 610-698 MHz	LAND MOBILE (IMT)	RoP B6	FSM, SLM, TUV, VUT / BGD, MLD, LAO, NZL, CKH, NIU, TKL, VTN
5.297	512-608 MHz	FIXED	RoP B6	CAN, CTR, CUB, SLV, GTM, GUY, JMC, USA, ALS, HWA, JON, MDW, PTR, VIR
		MOBILE		CAN, CTR, CUB, BAH, BRB, SLV, GTM, GUY, JMC, MEX, USA, ALS, HWA, JON, MDW, PTR, VIR
5.307A	614-694 MHz	MOBILE	RoP B6	ARS, BHR, EGY, IRQ, JOR, KWT. OMA, PSE, QAT, SYR, UAE
5.308	614-698 MHz	MOBILE	RoP B6	BLZ, CLM, GTM, SLV
5.308A	614-698 MHz	MOBILE (IMT)	Covered by RR**5.293** and RR**5.308**	BAH, BLZ, BRB, CAN, CLM, GTM, JMC, MEX, SLV, USA, ALS, HWA, JON, MDW, PTR, VIR
5.309	614-806 MHz	FIXED	RoP B6	SLV

** The areas in Region 2 are highlighted with green, in Region 3 with blue and in Region 1 without highlight.*

Solution 5 (5)

Return to the first band.

➢ Frequency, service, area and coord. criteria

RR No.	Freq. Band **	Service	Coordination criteria	Area
5.312A	694-790 MHz	MOBILE except aero.	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): 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, UZB
5.316B	790-862 MHz	MOBILE except aero.	RoP 5.316B Res. **749 (Rev.WRC-23)**	
5.312B	694/698-960 MHz	LAND MOBILE (HIBS)	RoP 5.312B	XR1, XR2
5.314A	698-960 MHz	LAND MOBILE (HIBS)	RoP 5.314A	AUS, CHR, HMD, ICO, NFK, MLD, FSM, PNG, TON, VNU
	703-733 MHz, 758-788 MHz, 890-915 MHz and 935-960 MHz			CHN, HKG, MAC, XCN, IND, INS, J, KOR, MLA, PHL, THA

Solution 5 (6)

Return to the first band.

➢ Frequency, service, area and coord. criteria

RR No.	Freq. Band **	Service	Coordination criteria	Area
5.322	862-960 MHz	BROADCASTING	Rec. ITU-R SM.851	ABA (African broadcasting area) except AFS, ALG, BDI, E, EGY, LSO, LBY, MRC, MWI, NIG, NMB, TZA, ZMB, ZWE
5.323	862-960 MHz	AERONAUTICAL RADIONAVIGATION	RoP B6	ARM, AZE, BLR, KAZ, UZB, KGZ, RUS, TJK, TKM, UKR
	862-880 MHz 915-925 MHz			BUL, ROU
5.325	890-942 MHz	RADIOLOCATION	RoP B6	USA, ALS, HWA, JON, MDW, PTR, VIR
5.326	903-905 MHz	MOBILE except aero.	RoP B6	CHL, PAQ

** The areas in Region 2 are highlighted with green, in Region 3 with blue and in Region 1 without highlight.*

Solution 5 (7)

Return to the first band.

➢ Frequency, service, area and coord. criteria

RR No.	Freq. band	Service	Coordination criteria	Area *
5.341A	1429-1452 MHz 1492-1518 MHz	LAND MOBILE (IMT)	RoP 5.341A, RoP B6	XR1 countries within 670 km from countries listed in No. **5.342** (ARM, AZE, BLR, KGZ, RUS, UKR, UZB): ALB, ARM, AUT, AZE, BIH, BLR, BUL, CZE, D, DNK, EST, FIN, GEO, GRC, HNG, HRV, I, IRQ, KAZ, KGZ, LTU, LVA, MDA, MKD, MNE, MNG, NOR, POL, ROU, RUS, S, SRB, SVK, SVN, SYR, TJK, TKM, TUR, UKR, UZB
5.341C	1429-1452 MHz 1492-1518 MHz	LAND MOBILE (IMT)	RoP B6	XR3
5.346	1452-1492 MHz	LAND MOBILE (IMT)	RoP 5.346 RoP B6	Countries mentioned in No. **5.346** and located within 670 km from countries listed in No. **5.342** (ARM, AZE, BLR, KGZ, RUS, UZB, UKR): IRQ
5.346A	1452-1492 MHz	LAND MOBILE (IMT)	RoP B6	XR3
5.410	2500-2690 MHz	FIXED (ST)	Not available	XR1
~~**5.429D**~~	~~3300-3400 MHz~~	~~LAND MOBILE (IMT)~~	~~RoP B6~~	~~ARG, URG, PRG~~

*The areas in Region 2 are highlighted with light green, in Region 3 with sky blue and in Region 1 without highlight.

Solution 5 (8)

Return to the first band.

➢ Frequency, service, area and coord. criteria

RR No.	Freq. band	Service	Coordination criteria	Area *
5.429F	3300-3400 MHz	LAND MOBILE (IMT)	RoP B6	CBG, IND, INS, LAO, PAK, PHL*, SNG, VTN (* no allocation to the LMS)
5.430A	3400-3600 MHz	MOBILE except aero.	RoP B6	XR1
5.431A	3400-3500 MHz	MOBILE except aero.	RoP B6	XR2
5.431B	3400-3600 MHz	LAND MOBILE (IMT)	RoP B6	XR2
5.432B	3400-3500 MHz	MOBILE except aero.	RoP B6	AUS, CKH, HMD, ICO, NFK, BGD, BRU, CHN, HKG, MAC, XCN, IND, INS, IRN, MLA, NZL, PHL, SNG, THA, AMS, KER, NCL, OCE, WAL, NIU, TKL
5.434	3600-3700 MHz	LAND MOBILE (IMT)	RoP B6	CAN, CHL, PAQ, CLM, CTR, PRG, SLV, USA, ALS, HWA, JON, MDW, PTR, VIR
5.441B	4800-4825 MHz 4825-4835 MHz 4835-4950 MHz 4950-4990 MHz	MOBILE (IMT) MOBILE except aero. (IMT) MOBILE (IMT) MOBILE except aero. (IMT)	Res. **223 (Rev. WRC-23)**	AFS, MRN, AGL, ARG, ARM, AZE, B, BDI, BEN, BFA, BOT, CBG, CHL, PAQ, CHN, HKG, MAC, XCN, CLM, CME, COD, COG, CPV, CTI, DJI, GAB, GHA, ~~GMB,~~ GUI, IRN, IRQ, KAZ, ~~KEN,~~ KGZ, KRE, LAO, LBR, LSO, ~~MAU,~~ MDG, MLI, MNG, ~~MOZ,~~ MWI, NGR, ~~NIG,~~ NMB, RUS, ~~SDN,~~ SSD, SWZ, TCD, TGO, ~~TZA,~~ UGA, UZB, VTN, ZMB, ZWE

Solution 5 (9)

Return to the first band.

➢ Frequency, service, area and coord. criteria

RR No.	Freq. band	Service	Coordination criteria	Area
5.447	5150-5250 MHz	MOBILE	Not available yet	CTI, EGY, LBN, SYR, TUN
5.457F	6425-7125 MHz	LAND MOBILE (IMT)	RoP B6	B, MEX
5.480A	10-10.5 GHz	LAND MOBILE (IMT)	RoP B6	MEX
5.482	10.6-10.68 GHz	FIXED MOBILE except aero.	Not available yet	XAA except ALG, ARM, ARS, AZE, BGD, BHR, BLR, EGY, GEO, IND, INS, IRN, IRQ, JOR, KAZ, KGZ, KWT, LBN, LBY, MDA, MRC, AOE, MTN, NIG, OMA, PAK, PHL, QAT, SNG, SYR, TJK, TKM, TUN, UAE, UZB, VTN
5.531B and **5.531E**	22-22.2 GHz	AERONAUTICAL MOBILE	RR5.531B and 5.531E	XR1 (RR5.531B) and Ctry_in_RR5.531E (BRU, IRN, MLA, SNG and THA)
5.553A	45.5-47 GHz	LAND MOBILE (IMT)	RoP B6	AFS, MRN, AGL, ALG, B, BEN, BFA, BHR, BLR, BOT, CPV, CTI, DJI, EGY, EST, HRV, GAB, GHA, GMB, GNB, GRC, GUI, HNG, IRN, IRQ, JOR, KOR, KWT, LBR, LSO, LTU, LVA, MAU, ROD, MDG, MLI, MOZ, MRC, AOE, MTN, MWI, NGR, NIG, NMB, OMA, QAT, S, SDN, SEN, SEY, SOM, SRL, SVN, SWZ, TGO, TUN, TZA, UAE, ZMB, ZWE

Solution 5 (10)

- For example, Switzerland is involved in eight (8) footnotes.
  - ✓ Some frequency bands are allocated subject to RR **9.21** coordination.
    - **5.92**: 1606.5-1625 kHz, 1635-1800 kHz, 1850-2160 kHz, 2194-2300 kHz, 2502-2850 kHz, 3500-3800 kHz for radiodetermination service
    - **5.295A**: 470-694 MHz, Mobile, except aeronautical service (Secondary)
    - **5.312B**: 694-960 MHz, Land mobile service (HIBS)
    - **5.410**: 2 500-2 690 MHz, Fixed service (Tropospheric scatter systems)
    - **5.430A**: 3400-3600 MHz, Mobile, except aeronautical service
    - **5.434A**: 3600-3800 MHz, Mobile, except aeronautical service
    - **5.482**: 10.6-10.68 GHz, Mobile, except aeronautical service
    - **5.531B**: 22-22.2 GHz, Aeronautical mobile service (aircraft station)
  - ✓ They are all related to additional allocations in Switzerland.

Exercise 6

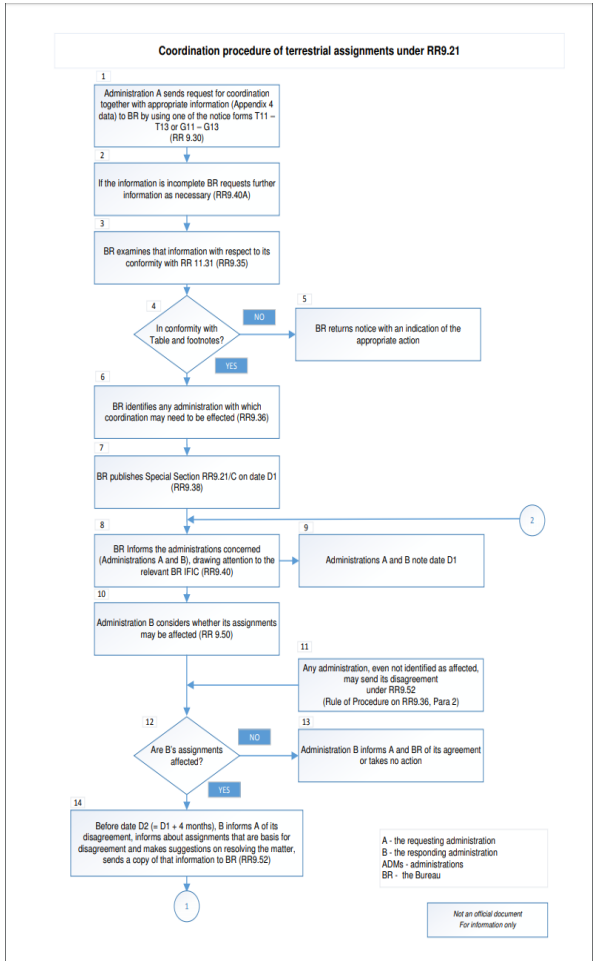
From the coordination procedure in the following slides,

1. Please find the statutory period of the coordination under No. **9.21**.
2. What will happen if an affected ADM does not reply to the request?

Solution 6

- Coordination Procedure is described in Article **9** (Nos. **9.23 - 9.65**)
- It shows the procedure in the aspects of
  - ✓ the notifying administration;
  - ✓ the potentially affected administrations; and
  - ✓ the BR

The flow chart is available at ITU web page.



Solution 6 (2)

Notifying ADM	Step	BR	Step	Affected ADM
Requests for coordination (RR **9.30**)	1	Acknowledges the receipt of the request		
	1-1	Requests further information as necessary (RR **9.40A**)		
	2	Examines with respect to conformity with RR **11.31**		
	2-1	If not conform, returns notice with an indication of the appropriate action		
	3	Identifies any administration with which coordination may need to be effected (RR **9.36**)		
	4	Publishes Special Section *RR9.21/C* on date *D1* (RR **9.38**)		
	4-1	Informs the concerned administrations (notifying and affected), drawing their attention to the relevant BR IFIC (RR **9.40**)	4-1	Note date D1

Solution 6 (3)

Notifying ADM		BR		Affected ADM
			5	Examines whether its assignments may be affected (RR **9.50**)
			6	Before date *D2* (= *D1* + ***4 months***), informs notifying ADM of its ~~disagreement~~, informs about assignments that are basis for disagreement and makes suggestions on resolving the matter, sends a copy of that information to BR (RR **9.52**)
			6-1	Any administration, even not identified as affected, may send its disagreement under RR **9.52** (Rule of Procedure on RR 9.36, Para 2)
Consultations with affected ADMs (RR **9.53**, RR **9.54** and RR **9.55**)	7	Assists administrations if requested (RR **9.59** or RR **9.63**)	7	Consultations with notifying ADM (RR **9.53**, RR **9.54** and RR **9.55**)

Solution 6 (4)

Notifying ADM		BR		Affected ADM
Before or on date *D2*, informs BR about coordination results including ADMs agreed, disagreed and not replied if any, also about modifications of characteristics (RR **9.55** and RR **9.58**)	8	If characteristics were changed, publishes a new Special Section *RR9.21/C* with modified characteristics (RR **9.58**) based on principles of RoP on RR **9.27**		
	8-1	If not, publishes Special Section *RR9.21/D* after *D2* (RR **9.53A**) with list of ADMs: 1) submitted their agreement; 2) submitted their disagreement; **3) not responding will be regarded as unaffected** (RR **9.52C**).		

Solution 6 (5)

Notifying ADM		BR		Affected ADM
Consultations with affected ADMs (RR **9.53**, RR **9.54** and RR **9.55**)	12	Assists administrations if requested (RR **9.59** or RR **9.63**)	12	Consultations with notifying ADM (RR **9.53**, RR **9.54** and RR **9.55**)
	13	Proposes solution	13	
Proceed for Article **11** notification	15		14	Agreement
Disagreement remains unresolved and defers Article **11** notification for 6 months (RR **9.64**)	15		14	Disagreement

Exercise 7

Where are the coordination criteria used for the identification of the affected administrations?

Solution 7

- The criteria for identification of affected administrations required for the application of the No. **9.21** procedure are fully or partially available
  - ✓ in the footnotes, e.g. Nos. **5.225A, 5.430A, 5.431B** and **5.432B**;
  - ✓ in the WRC Resolutions, e.g. Resolutions **223 (Rev.WRC-23)**, **749 (Rev.WRC-23)** and **760 (Rev.WRC-23)**; or
  - ✓ in the associated Rules of Procedure (e.g. RoP B4, B5 and B6)
- Coordination criteria is normally given in the form of
  - ✓ electric field strength level (dBµV/m);
  - ✓ power flux density (dBW/m^2); or
  - ✓ coordination distance (km).

Solution 7

- Coordination criteria given in RoP
  - ✓ RoP Section B4
    - Rules in the context of the frequency allocations in Nos. **5.61**, **5.87A**, **5.92**, **5.93** and **5.123** in the frequency range between 9 kHz and 28 MHz
  - ✓ RoP Section B5
    - Rules in the context of the frequency allocation to the RDS in No. **5.92** in the frequency bands 1 606.5-1 625 kHz, 1 635-1 800 kHz, 1 850-2 160 kHz, 2 194-2 300 kHz, 2 502-2 850 kHz and 3 500-3 800 kHz
  - ✓ RoP Section B6
    - Rules in the context of frequency allocations or identifications governed by Nos. **5.292, 5.293, 5.295, 5.295A, 5.296A, 5.297, 5.307A, 5.308, 5.308A, 5.309, 5.323, 5.325, 5.326, 5.341A, 5.341C, 5.346, 5.346A, 5.429F, 5.430A, 5.431A, 5.431B, 5.432B, 5.434A, 5.457F, 5.480A** and **5.553A** in the frequency ranges between 470 MHz and 47 GHz

Exercise 8

Footnote No. **5.225A** provides two types of criteria.

Please identify the more stringent one.

Solution 8

Coordination criteria in the footnotes

- No. **5.225A** in the frequency band 154-156 MHz for the RLS operating from terrestrial locations, the following criteria shall be used:
  - in Region 1, the field-strength value of 12 dB(μV/m) for 10% of the time produced at 10 m above ground level in the 25 kHz reference frequency band at the border of the territory of any other administration
  - in Region 3, the interference-to-noise ratio (I/N) value of −6 dB (N = −161 dBW/4 kHz), or −10 dB for applications with greater protection requirements, such as PPDR, for 1% of the time produced at 60 m above ground level at the border
- Nos. **5.430A, 5.431B, 5.432B, 5.434** in the frequency band 3 400-3 700 MHz, the MS except AMS shall ensure that
  - pfd produced at **3 m** above ground does not exceed **−154.5 dB(W/(m^2.4 kHz))** for more than **20%** of time at the border of the territory of any other administration

Solution 8 (2)

- Comparison of the criteria in No. **5.225A**.
  - ✓ E = N + I/N + 20 log(4 πf/c) + 10 log(30) + 10 log(25kHz/4kHz) + 120
  - ✓ For given values N = -161 dBW/4kHz and N = -10 dB in Region 3,
  - ✓ E = -12 dB(μV/m·25kHz).
  - ✓ Therefore, the criteria for Region 3 is 24 dB more stringent than the criteria for Region 1.
  - ✓ Furthermore, the antenna height 60 m and the time percentage 1% in Region 3 are also much more stringent than those (10 m and 10%) in Region 1.

Exercise 9

From the coordination criteria given in Resolutions **749** and **760**,

please explain the benefit of the harmonized frequency arrangement.

Solution 9

Coordination criteria in WRC Resolutions

- Resolution **749 (Rev. WRC-19)**
  - Base station in 791-821 MHz: 70/125/175 km*
    (* land path ≥ 90% / 50% ≤ land path < 90% / land path < 50%)
  - Mobile station in 832-862 MHz: 150/175 km** (** land path ≥ 50% / land path < 50%)
  - Other cases - base station: 432/450 km** , mobile station: 410 km
- Resolution **760 (Rev. WRC-19)**
  - Base station in 758-788 MHz: 70/125/175 km*
  - Mobile station in 703-733 MHz: 0 km
  - Other cases - base station: 432/450 km** , mobile station: 410 km
- The benefit of frequency arrangement: Shortening the coordination distance.

Exercise 10

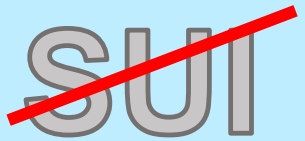
From the RoP on **5.312A**, **5.316B**, **5.341A** and **5.346**,
please check if your administration needs to request No. 9.21 coordination in the bands 694-862 MHz and 1429-1518 MHz.
(Only for Region 1 countries)

Solution 10 (2)

Coordination criteria given in RoP

✓ RoP **5.312A** and RoP **5.316B**

- Those Region 1 administrations whose territories are located beyond the distance of 450 km from the countries mentioned in No. **5.312** are exempted from application of No. **9.21** procedure to their MS except AMS assignments in the frequency bands 694-790 MHz and 790-862 MHz.



✓ RoP **5.341A** and RoP **5.346**

- Those Region 1 administrations whose territories are located beyond the distance of 670 km from the countries mentioned in No. **5.342** are exempted from application of No. **9.21** procedure to their IMT stations operating in the frequency band 1 429 -1 518 MHz.

Exercise 11

Please explain the coordination criteria for No. **9.21** coordination and No. **9.19** coordination in the frequency band 1429-1518 MHz.

Solution 11

➢ Summary of requirements in the frequency band 1 429-1 518 MHz

Process	Freq. band	Service (App.)	Criteria	Area
RR**9.21** Coord.	1429-1518 MHz	LAND MOBILE (IMT)	-181 dB(W/(m^2 · 4 kHz)) See RoP B6	Regions 1 countries within 670 km from countries listed in No. **5.342** (ARM, AZE, BLR, KGZ, RUS, UKR, UZB): ALB, ARM, AUT, AZE, BIH, BLR, BUL, CZE, D, DNK, EST, FIN, GEO, GRC, HNG, HRV, I, IRQ, KAZ, KGZ, LTU, LVA, MDA, MKD, MNE, MNG, NOR, POL, ROU, RUS, S, SRB, SVK, SVN, SYR, TJK, TKM, TUR, UKR and UZB) and Region 3
RR**9.19** Coord.	1452-1492 MHz	MOBILE except Aero. (IMT) Other cases of Terrestrial service	−154 dB(W/(m^2 · 4 kHz)) See RoP 9.19	Regions 1 and 3

✓ The coordination requirement under No. **9.21** is effected by making coordination request to the BR

✓ The coordination requirement under No. **9.19** should be effected bilaterally with affected ADMs without involvement of the BR

Exercise 12

Please describe the difference between the coordination criteria given in Resolution **223** and pfd limit given in No. **5.441B** for the frequency band 4800-4990 MHz.

Solution 12

➢ Requirements in the frequency band 4 800-4 990 MHz

Process	Freq. band	Service (Application)	Criteria	Area
RR**9.21** Coord.	4800-4825 MHz 4825-4835 MHz 4835-4950 MHz 4950-4990 MHz	MOBILE (IMT) MOBILE except aero. (IMT) MOBILE (IMT) MOBILE except aero. (IMT)	300/450 km to the border for protection of AMS 70 km for the protection of FS	Countries listed in No. **5.441B** (AFS, MRN, AGL, ARG, ARM, AZE, B, BDI, BEN, BFA, BOT, CBG, CHL, PAQ, CHN, HKG, MAC, XCN, CLM, CME, COD, COG, CPV, CTI, DJI, GAB, GHA, GUI, IRN, IRQ, KAZ, KGZ, KRE, LAO, LBR, LSO, MDG, MLI, MNG, MWI, NGR, NMB, RUS, SSD, SWZ, TCD, TGO, UGA, UZB, VTN, ZMB and ZWE)
5.441B PFD limit			-155 dB(W/(m^2·MHz))* up to19 km above sea level and 20 km from the coast	Countries listed in No. **5.441B** except countries listed in Res. **223** (AGL, ARG, AZE, BDI, BEN, BFA, BOT, CHL, PAQ, CLM, CME, COD, COG, CPV, CTI, DJI, GAB, GHA, GUI, IRN, IRQ, KGZ, KRE, LBR, LSO, MDG, MLI, MNG, MWI, NGR, NMB, SSD, SWZ, TCD, TGO, UGA and ZMB) ** AFS, ARM, B, CBG, CHN, KAZ, LAO, RUS, UZB, VTN and ZWE are exempted from the pfd limit by Res. **223*****

✓ The coordination requirement is effected by making coordination request to the BR, under No. **9.21**

✓ The PFD limit would be checked when the assignment is notified under Article **11** to the BR

Exercise 13

Please investigate which propagation models are used in application of No. **9.21** in the range 694 MHz-47 GHz.

Solution 13

➢ Propagation Models

- ✓ The calculation results of power flux density or electric field strength may vary according to the path loss prediction methods (e.g. Recommendations ITU-R P.452, P.525, P.528, P.1546 and etc.)
- ✓ Therefore, it is important to have an agreement among concerned parties on a propagation model for a coordination procedure.
- ✓ If no propagation model is specified with a given criteria in the Radio Regulations, the BR would request the **RRB to decide** it based on the available ITU-R Recommendations and Reports.

Solution 13 (2)

- Propagation Models mentioned in RoP B6
  - ✓ Recommendation ITU-R P.452
    - Valid for prediction of interference between stations on the surface of the Earth at frequencies from about 100 MHz to 50 GHz, accounting for both clear-air and hydrometeor scattering interference mechanisms (See example.)
  - ✓ Recommendation ITU-R P.1546
    - Valid for point-to-area radio propagation predictions for terrestrial services in the frequency range 30 MHz to 4 000 MHz, up to 1 000 km distance and effective transmitting antenna heights less than 3 000 m.
  - ✓ Recommendation ITU-R P.528
    - Valid for prediction of transmission loss in the frequency range 100 MHz -130 GHz for aeronautical services.
- More information related to propagation models and software
  - ✓ P-series ITU-R Recommendations link
  - ✓ ITU-R Study Group 3 Software and data link

Exercise 14

As a notifier,
please think about what do you need to do for effecting the coordination under No. **9.21**.

Solution 14

- Before notifying frequency assignments for recording in the MIFR in accordance with Article **11**
  - ✓ Check if the corresponding frequency allocation is subject to coordination under No. **9.21**
    - Using the footnotes of Article **5** of the RR (See also file attached in the link 'Frequency bands')
  - ✓ Submit a request for coordination to the BR through WISFAT
    - Using the notice type G11, G12 or G13 (for GE06 Agreement bands), and T11, T12 or T13 (for all other bands)
    - WISFAT process for the request for coordination is the same as that of a notification under Article **11**
- After submitting a request for coordination
  - ✓ Check if the request is published in a Special Section RR9.21 (in Part C) correctly
  - ✓ Implement necessary steps for coordination with the administrations identified as affected.

Solution 14 (2)

- At the end of the statutory coordination period of 4 months
  - ✓ Inform the BR of the coordination results, including the names of administrations giving their agreement, disagreement and those that did not reply, together with any modification, if necessary.
  - ✓ Check if the assignment is published in a Special Section RR9.21 (Part D)
- After the publication of SS RR9.21 (Part D)
  - ✓ Notify the frequency assignment to the BR through WISFAT in accordance with RR Article **11**
    - Including the name(s) of administration(s) which gave an agreement to the assignment in the coordination information of the notice
  - ✓ Check if the assignment is published in a BR IFIC (Part 1)
  - ✓ Check if the assignment is published in a BR IFIC (Part 2)

Exercise 15

As an affected administration, please think about what do you need to do for responding to the coordination request under No. **9.21**.

Solution 15

- Upon receiving a coordination request or publication of the coordination request in a special section RR9.21 (Part C)
  - ✓ Check if the special section includes your country name in the list of administrations, identified as potentially affected
  - ✓ Identify stations of your country, located within the coordination distance
  - ✓ Respond to the coordination request
    - Agreement; or
    - Disagreement with information of its **assignments** upon which that disagreement is based
  - ✓ Send a copy of that information to the BR

Solution 15 (2)

- After the publication of SS RR9.21 (Part D)
  - ✓ Check if the decision of your Administration is correctly reflected in relation to the corresponding assignment.
- A point that should be kept in mind
  - ✓ For coordination requests under No. **9.21** an administration, not responding within the statutory **4 months** period, shall be regarded as unaffected. (No. **9.52C**)

Exercise 16

1. Which frequency bands are mostly interested in your country?

2. For which frequency allocations, the specific criteria is not available yet for identification of affected administrations?

Solution 16

- During the period of 2012-2026, there have been 16 906 requests for coordination under No. **9.21** for TS except BS
  - ✓ All of them are in accordance with Nos. **5.312A, 316B**, **5.430A, 5.434A** and **5.441B**
- For some bands, no clear guidance is available yet, for the criteria applicable for identification of affected administrations under No. **9.21**:
  - ✓ for the frequency bands 74.8-75.2 MHz, 87.5-88 MHz, 108-111.975 MHz, 230-235 MHz, 328.6-335.4 MHz, 430-440 MHz, 2 500-2 690 MHz, 5 150-5 250 MHz and 10.6-10.68 GHz mentioned in Nos. **5.181**, **5.190**, **5.197**, **5.251**, **5.259**, **5.279**, **5.410**, **5.447** and **5.482** respectively.

Exercise 17

From an example notice with a frequency of 3 550 MHz in a Region 1 country, please check why one neighboring country is identified as affected while others are not.

Solution 17

➢Example 1 for RR9.21

BR ID: 120184205
Administration: LVA
Adm's unique ID: T13_Test
Fragment: Req_agrt
Provision: RR9.21
Notice type: T13 / ADD
Date Rcv: 02 Jul 2020
Date In Use: 20 Feb 2019

Assigned frequency: 3550 MHz
Bandwidth: 100M
Examination category: C9_21
Class of station: ML
Geographic area: LVA
Site name: Test
Coordinates: 23°40'25"E - 56°32'7"N
Coordinates: 23.6736° ; 56.5353°

Administration	Provision	Coord Status	Source	Date effective	Declared by
BLR	COORD	COORD COMPLETED	NOTIFIER	02-Jul-2020	NOTIFIER
EST	COORD	COORD COMPLETED	NOTIFIER	02-Jul-2020	NOTIFIER
LTU	COORD	COORD COMPLETED	NOTIFIER	02-Jul-2020	NOTIFIER
LTU	RR9.36	COORD REQUIRED	ITU	19-Oct-2020	ITU
S	COORD	COORD COMPLETED	NOTIFIER	02-Jul-2020	NOTIFIER

Solution 17 (2)

- 6 test cases were checked (BLR, EST, LTU, POL, RUS, S)
  - ✓ Case 2.1: Considered Administration: **LTU** - Status: **COORD REQUIRED**
  - ✓ Case 2.1: Tx antenna parameters: Location 23°41'46"E - 56°34'54"N - Gain: 0.0 dB - Height: 2 m - Polarization: Unknown - Radiated power: 47.5 dBW - Protection Criteria: ROP B6 (3.8)
  - ✓ Case 2.1: Test point antenna parameters: Location 23°40'51"E - 56°21'47"N - Country LTU - Gain 0.0 dB - Height 3.0 m
  - ✓ Case 2.1: Calculation results: Distance 24.3 km - Path Loss 172.8 dB – Maximum Calculated pfd **-136.9 dB(W/m²·4kHz)** - Trigger pfd **-154.5 dB(W/m²·4kHz)**
  - ✓ Case 2.1: Observation: LTU in coord list (shortest path case heuristic)
  - ✓ Case 2.2: Considered Administration: **BLR** - Status: **COORD NOT REQUIRED**
  - ✓ Case 2.2: Tx antenna parameters: Location 23°36'27"E - 56°39'12"N - Gain: 0.0 dB - Height: 2 m - Polarization: Unknown - Radiated power: 47.5 dBW - Protection Criteria: ROP B6 (3.8)
  - ✓ Case 2.2: Test point antenna parameters: Location 26°34'11"E - 55°39'41"N - Country BLR - Gain 0.0 dB - Height 3.0 m
  - ✓ Case 2.2: Calculation results: Distance 214.1 km - Path Loss 211.3 dB - Maximum Calculated pfd **-175.3 dB(W/m²·4kHz)** - Trigger pfd -154.5 dB(W/m²·4kHz)
  - ✓ Case 2.2: Observation: BLR not in coord list (brute force case)

Exercise 18

From an example notice with frequency 600 MHz in a Region 2 country, please check which coordination criteria are used.

Solution 18

➢Example 2 for RR9.21

BR ID: 120184194
Administration: CUB
Administration's unique ID: CUB-T11-2
Fragment: Req_agrt
Provision: RR9.21
Notice type: T11 / ADD
Date Rcv: 02 Jul 2020

Assigned frequency: 600 MHz
Bandwidth: 6M00
Examination category: C9_21
Class of station: FX
Geographic area: CUB
Site name: LOS PALACIOS
Coordinates: 83°13'37"W - 22°39'12"N

➢No country was identified as affected.

➢14 test cases were considered (BAH, BLZ, CLM, G/CYM, GTM, HND, HTI, JMC, MEX, NCG, SLV, HND/SWN, G/TCA, USA)

- ✓ Case 14: Tx antenna parameters: Location 83°13'37"W - 22°39'12"N - Gain: 22.8 dBd - Height: 15 m - Polarization: Vertical - Radiated power: 22.8 dBW - Protection Criteria: ROP B6
- ✓ Case 14: Test point antenna parameters: Location 82°07'26"W - 24°32'48"N - Country USA - Gain 0.0 dB - Height 10 m
- ✓ Case 14: Calculation results: Distance 238.7 km - Path Loss 105.0 dB - Maximum Calculated Field Strength 4.8 dB(uV/m) - Trigger Field Strength 20.0 dB(uV/m)

Exercise 19

From an example notice with frequency 1 462 MHz in a Region 3 country, please follow the process for identification of affected administrations.

Solution 19

➢Example 3 for RR9.21 with nature of service = ‘IM’

BR ID: 119107006
Administration: KOR
Adm’s unique ID: 322012110083767020 13
Fragment: NTFD_RR
Provision: RR11.2
Notice type: T12
Date Rcv: 08 Nov 2019

Assigned frequency: 1462 MHz
Bandwidth: 20M0
Examination category: C9_21
Class of station: FB
Geographic area: KOR
Site name: SKT Backryung
Coordinates: 124°38’04“E - 37°57’08"N

Administration	Provision	Coord Status	Source	Date effective	Declared by
CHN	RR9.36	COORD REQUIRED	ITU	19-Oct-2020	ITU
KRE	RR9.36	COORD REQUIRED	ITU	19-Oct-2020	ITU
CHN	RR9.36	COORD COMPLETED	NOTIFIER	02-Jul-2020	NOTIFIER
KRE	RR9.36	COORD COMPLETED	NOTIFIER	02-Jul-2020	NOTIFIER

Solution 19 (2)

- **5.346A** The frequency band 1 452-1 492 MHz is identified for use by administrations in Region 3 wishing to implement International Mobile Telecommunications (IMT) in accordance with Resolution **223 (Rev.WRC-19)** and Resolution **761 (Rev.WRC-19)**. The use of this frequency band by the above administrations for the implementation of IMT is subject to agreement obtained under No. **9.21** from countries using stations of the aeronautical mobile service. This identification does not preclude the use of this frequency band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations. (WRC-19)

- RoP B6

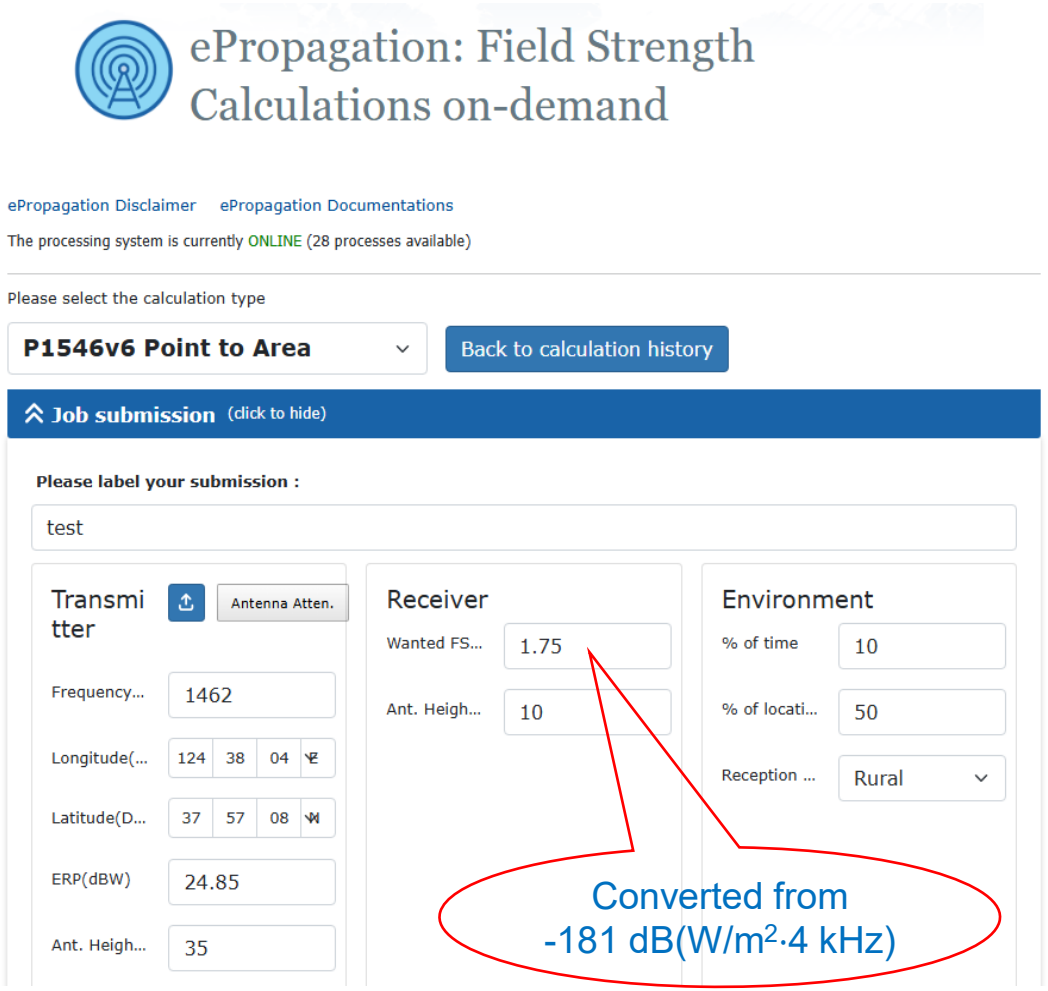
3.6 For protection of ground-based stations in the aeronautical mobile service in the frequency band 1 429-1 518 MHz from IMT, in the context of the provisions of Nos. **5.341A**, **5.341C**, **5.346** and **5.346A**, the coordination distances are calculated using the propagation curves given in Recommendation ITU-R P.1546-5 for 10% of time and 50% of locations with the coordination trigger power flux density of -181 dB(W/m^2) within 4 kHz of reference bandwidth produced at the height of 10 m above ground level as given in Recommendation ITU-R M.1459-0.

For protection of stations on-board aircraft in the aeronautical mobile service, the coordination distance of 450 km is used.

Solution 19 (3)

- RR9.21 exam is applicable.

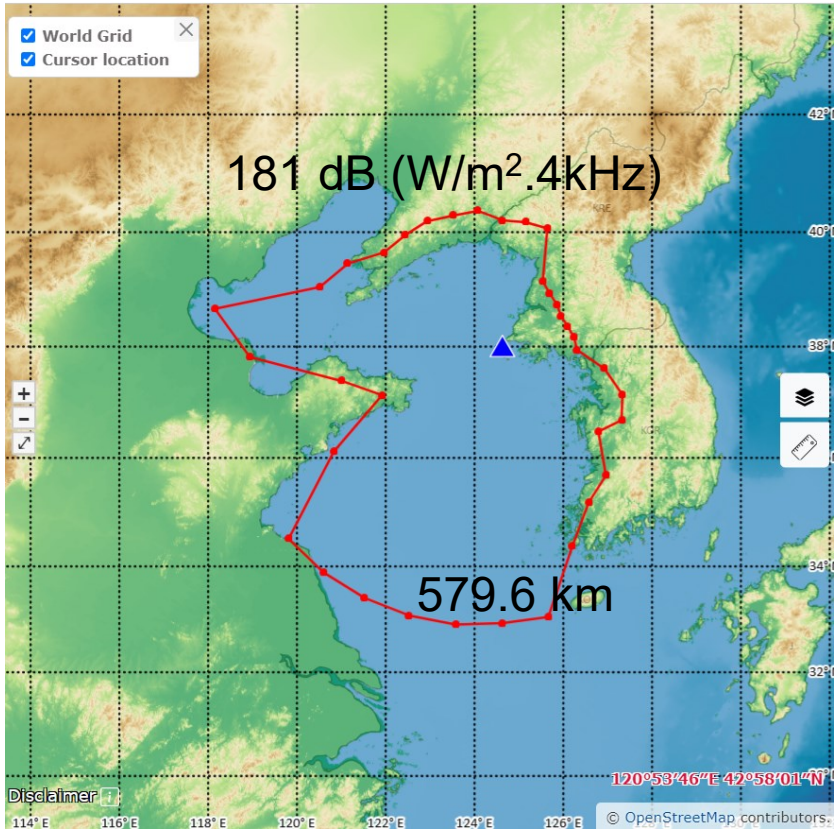
pwr_xyz	Y
pwr_ant	12
pwr_dbw	24.85
pwr_eiv	I
ant_dir	D
azm_max_e	120
gain_max	12.85
gain_type	I
bmwdth	30
elev	-3
polar	
hgt_agl	35
tx_rx	TX



https://www.itu.int/ITU-R/eTerrestrial/EPropagation

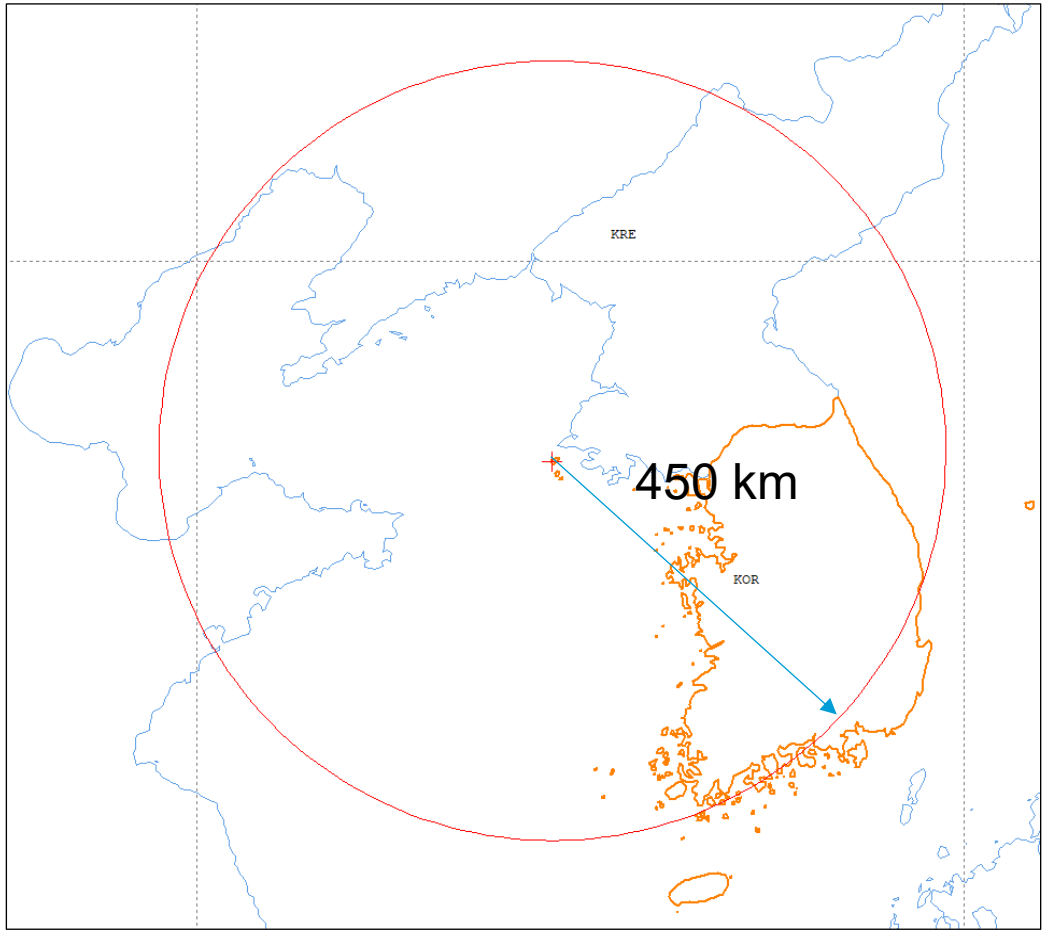
Solution 19 (4)

- RR9.21 exam is applicable.
  - ✓ Criteria for protection of AMS aeronautical station: 181 dB (W/m^2.4kHz) for 10% time and 50% location using Rec. ITU-R P.1546
  - ✓ Countries within this criteria: 2 countries (CHN, KRE)



Solution 19 (5)

- RR9.21 exam is applicable.
  - ✓ Criteria for protection of AMS aircraft station: 450 km.
  - ✓ Countries within 450 km: 2 country (CHN, KRE)



Exercise 20

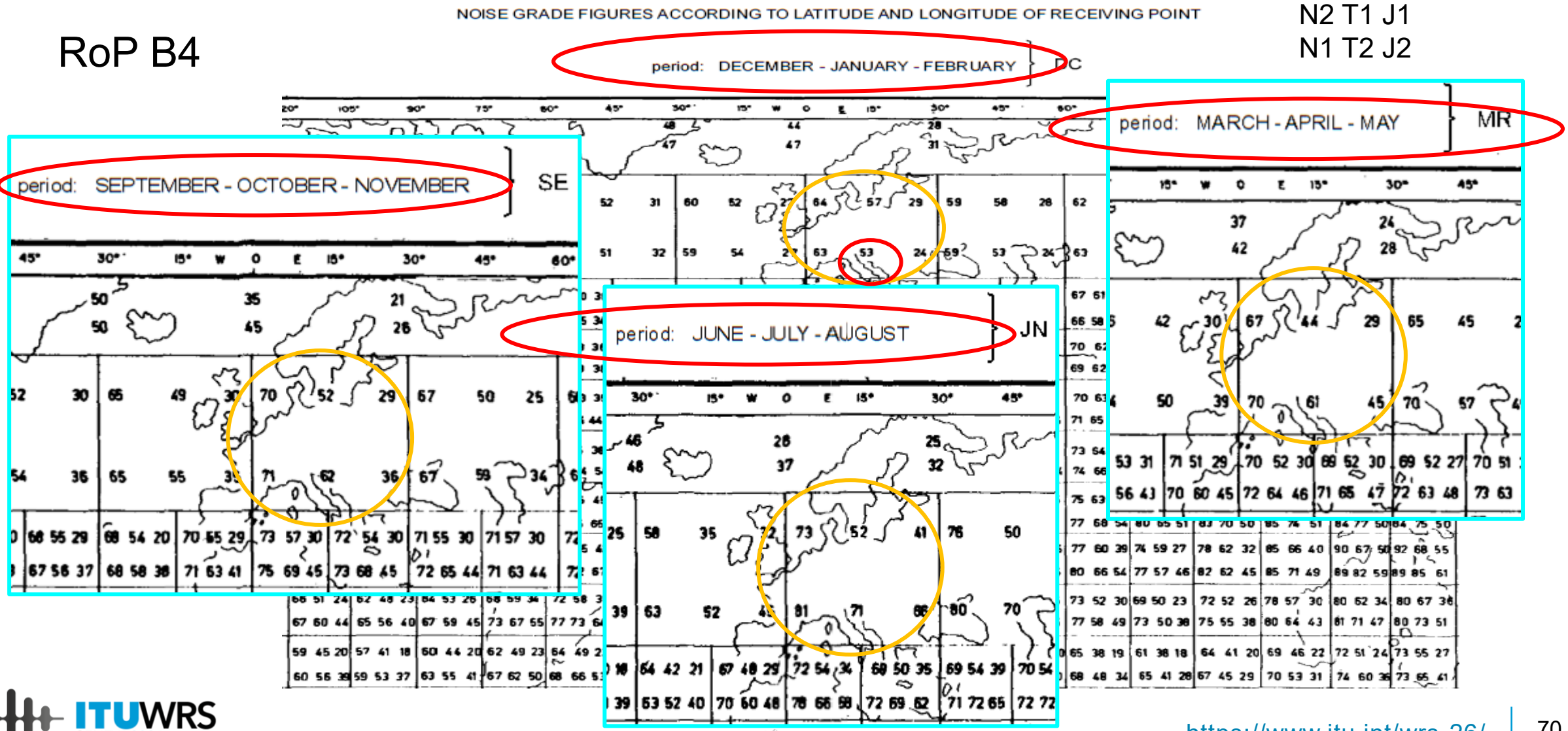
As a potentially affected administration, please find the minimum field strength to be protected in your country from a **J3E** SSB public telephony stations of neighboring countries using 2 165 kHz and 1 kW under the allocation of No. **5.93**.

Solution 20

- The answer varies country by country.
- The following answer is for the case of Switzerland.
  - ✓ From the noise grade figures for four seasons (DC, MR, JN and SE) and 6 time slots (N1 N2, J1, J2, T1 and T2) in Table 1 to 4 of the RoP B4, the median value should be selected, if no specific condition is given. For SUI, the value of 53 can be selected.
  - ✓ From the Table 5A of RoP B4, the worst-case criteria would be selected.
    In Switzerland, it is 2 dB(μV/m).
  - ✓ For the J3E public telephony, from the same Table, it should be compensated by 25dB and results in **27 dB**(μV/m).

Solution 20 (2)

RoP B4



N2 T1 J1
N1 T2 J2

Solution 20 (3)

Minimum field strength to be protected (dB relative to 1 μV/m) Type of transmission: Telegraphy, aural reception (B > 0.5 kHz)

5A

NOISE GRADE	(kHz)																	
	10			20			50			100			200			500		
	N2 N1	T1 T2	J1 J2	N2 N1	T1 T2	J1 J2	N2 N1	T1 T2	J1 J2	N2 N1	T1 T2	J1 J2	N2 N1	T1 T2	J1 J2	N2 N1	T1 T2	J1 J2
100	72	72	74	70	72	81	72	72	74	70	72	81	72	72	74	70	72	81
	72	74	77	71	75	81	72	74	77	71	75	81	72	74	77	71	75	81
90	69	69	72	67	69	77	69	69	72	67	69	77	69	69	72	67	69	77
	70	71	74	67	71	77	70	71	74	67	71	77	70	71	74	67	71	77
80	66	66	69	63	65	73	66	66	69	63	65	73	66	66	69	63	65	73
	67	68	71	63	66	72	67	68	71	63	66	72	67	68	71	63	66	72
70	64	63	66	60	61	68	64	63	66	60	61	68	64	63	66	60	61	68
	64	65	68	59	61	68	64	65	68	59	61	68	64	65	68	59	61	68
60	61	60	64	57	57	64	61	60	64	57	57	64	61	60	64	57	57	64
	61	61	66	56	56	63	61	61	66	56	56	63	61	61	66	56	56	63
50	58	57	61	53	53	60	58	57	61	53	53	60	58	57	61	53	53	60
	58	58	63	52	52	59	58	58	63	52	52	59	58	58	63	52	52	59
40	55	55	58	49	50	56	38	39	46	26	28	35	14	16	22	7		
	55	55	60	49	47	55	38	35	43	26	24	32	14	14	20			
30	52	52	56	46	47	52	33	34	40	19	22	27	11	11	13	7		
	52	51	58	45	42	50	32	28	36	20	16	24	11	11	11			
20	50	49	54	43	42	48	28	28	33	15	15	20	11	11	11	7		
	49	48	55	40	37	46	27	20	30	15	15	15	11	11	11			

	(MHz)														
	1			1.5			2			3			4		
	N2 N1	T1 T2	J1 J2	N2 N1	T1 T2	J1 J2	N2 N1	T1 T2	J1 J2	N2 N1	T1 T2	J1 J2	N2 N1	T1 T2	J1 J2
100	52	54	52	47	50	41	44	47	34	38	42	23	34	38	16
	51	55	54	47	49	43	42	45	36	36	39	27	32	35	22
90	42	44	42	38	40	32	35	38	26	31	34	17	28	31	11
	41	45	44	37	40	33	34	36	28	30	31	20	27	28	15
80	32	34	32	28	31	23	27	29	18	24	27	10	22	25	5
	31	35	34	28	30	25	26	28	20	23	24	13	21	22	9
70	22	24	22	19	22	14	18	20	10	17	19	3	16	18	1
	21	25	24	19	22	16	18	20	12	16	18	6	15	16	4
60	12	14	12	10	12	6	10	12	2	10	12	−1	10	12	−1
	11	15	14	9	12	7	9	11	4	9	11	0	9	10	−1
50	4	4	4	3	3	3	2	3	2	3	4	−1	4	5	−1
	4	5	4	3	3	3	2	3	2	2	3	−1	4	4	−1
40	4			3			2			−1			−1		
30	4			3			2			−1			−1		
20	4			3			2			−1			−1		

Constants to be added to obtain other types of emissions			
Digital transmissions, J2D			−8
Narrow-band TG (B < 0.5 kHz)			−5
Telegraphy aut. (B > 0.5 kHz)			4
Phototelegraphy			16
Telephony	CO	J3E R3E B8E	14
		H3E	20
		A3E	23
	CP	J3E R3E B8E	25
		H3E	31
		A3E	34

Exercise 21

Please find the coordination distance to assure a protection ratio of 17 dB in your country from the frequency assignments to a radiodetermination station using 30 W in a neighboring country under the allocation of No. **5.92**.

Solution 21

- The answer can vary country by country.
- The following answer is for the case of Switzerland.
  - ✓ From the Table 1 to 4 of the RoP B4, the median value of noise grade figures over the four seasons were selected because no information on operating seasons was given. The selected noise figure is 53.
  - ✓ Having the protection criteria 17 dB and power 30 W, the coordination distance can be directly read as **5 000 km** from the Table 1 of RoP B5.

Solution 21 (2)

ROP B5

TABLE 1

Coordination distance for assuring protection ratio of 17 dB
(protected transmission: telegraphy, automatic reception)

Noise degree		50	60	70	80
Minimum field strength (dB relative to 1 µV/m)		4	13	22	30
Power (of the interfering transmission)		**Coordination distance (km)**			
1 W	0 dBW	4 400	3 400	1 800	800
3 W	5 dBW	4 900	3 900	2 800	1 400
10 W	10 dBW	5 000	4 500	3 500	2 200
30 W	15 dBW	5 000	5 000	4 000	3 100
50 W	17 dBW	5 000	5 000	4 200	3 400

Exercise 22

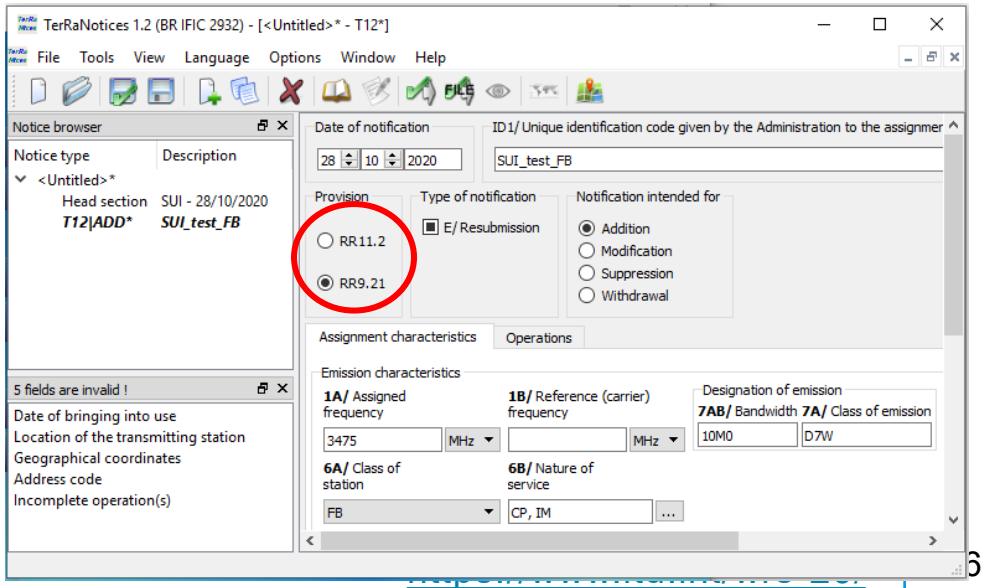
Please create a notice file for a request for coordination using TerRaNotice.

Solution 22

Hint

- ✓ Example test notice is in the following slide.
- ✓ Open TerRaNotice.
- ✓ Select “**RR9.21**”
- ✓ Fill in all the required fields from the information of the station that you have chosen in your country.
- ✓ Save the file after validation.





Errors/Warnings in the notice:

- Error(s)
  - Invalid fragment. The acceptable values are: t_fragment

Solution 22 (2)

Example notices

<HEAD>
t_email_addr=chungsang.ryu@itu.int
t_adm=SUI
t_d_sent=2018-11-01
</HEAD>
<NOTICE>
t_notice_type=T12
t_fragment=NTFD_RR
t_prov=RR11.2
t_action=ADD
t_adm_ref_id=SUI_test_FB
t_freq_assgn=3475.00
t_long=+0085307
t_lat=+460636
t_site_name=SUI_test
t_addr_code=A
t_op_hh_fr=00:00
t_op_hh_to=24:00
t_emi_cls=D7W
t_d_inuse=2010-04-22
t_site_alt=80
t_station_id=3L KNS312 1
t_d_adm_ntc=2010-05-21
t_bdwdth_cde=10M0
t_is_resub=FALSE
t_stn_cls=FB
t_ctry=SUI
t_nat_srv=CP
<COORD>
t_adm=F
t_adm=I
</COORD>
<ANTENNA>
t_pwr_xyz=Y
t_ant_dir=D
t_elev=-8
t_pwr_dbw=48
t_azm_max_e=90
t_pwr_eiv=I
t_hgt_agl=30
t_gain_max=23
t_pwr_ant=25
t_bmwdth=65
t_gain_type=I
<RX_STATION>
t_long=+0085307
t_lat=+460636
t_geo_type=CIRCLE
t_radius=5
</RX_STATION>
</ANTENNA>
</NOTICE>

<NOTICE>
t_notice_type=T13
t_fragment=NTFD_RR
t_prov=RR11.9
t_action=ADD
t_adm_ref_id=SUI_test_ML
t_freq_assgn=3475.000000
t_long=+0085307
t_lat=+460636
t_site_name=SUI_test
t_addr_code=A
t_op_hh_fr=00:00
t_op_hh_to=24:00
t_emi_cls=D7W
t_d_inuse=2010-04-22
t_d_adm_ntc=2010-05-21
t_bdwdth_cde=10M0
t_is_resub=FALSE
t_stn_cls=ML
t_ctry=SUI
t_nat_srv=CP
<COORD>
t_adm=RUS
</COORD>
<ANTENNA>
t_pwr_xyz=Y
t_pwr_dbw=-5
t_pwr_eiv=I
t_pwr_ant=-7
<TX_STATION>
t_long=+0085307
t_lat=+460636
t_geo_type=CIRCLE
t_radius=5
</TX_STATION>
</ANTENNA>
</NOTICE>
<TAIL>
t_num_notices=2
</TAIL>

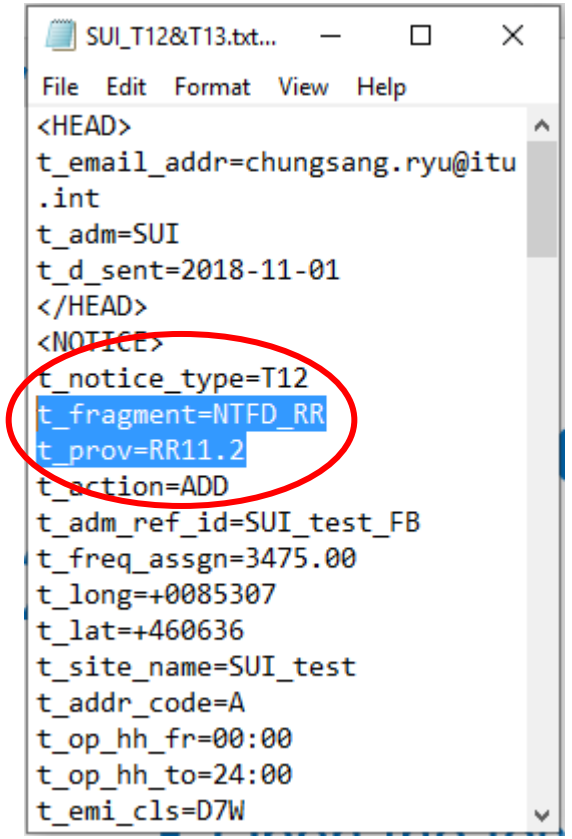
Exercise 23

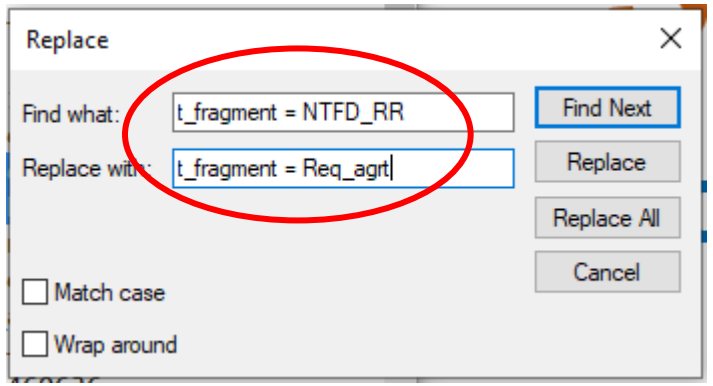
Please create a notice file for a request for coordination by converting an existing notice file.

Solution 23

Hint

- ✓ Example notice is in Solution 22.
- ✓ Open the test notice with Notepad, Notepad++ or MS Word.
- ✓ Replace “t_fragment=NTFD_RR” with “t_fragment=Req_agrt”
- ✓ Replace “t_prov=RR11.2” with “t_prov=RR9.21”
- ✓ Replace “t_prov=RR11.9” with “t_prov=RR9.21”
- ✓ Save the file.



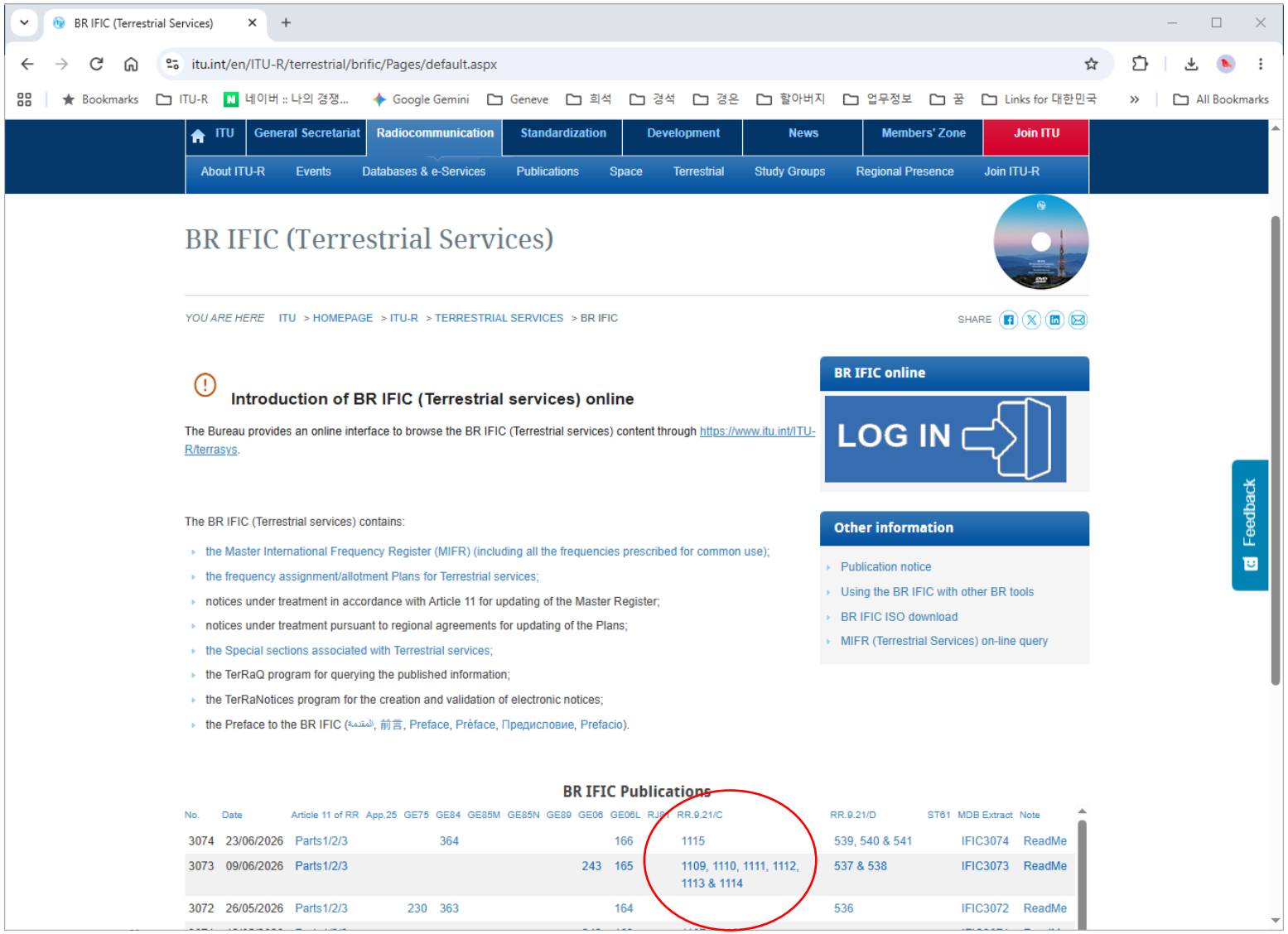


Exercise 24

1. From SS RR9.21/C/1111 and 1114 (Part C) on the BR IFIC webpage, please check whether your administration is involved.
2. From SS RR9.21/D/558 and 561 (Part D), please check the coordination results of the RR9.21 coordination procedure.

Solution 24

- BR IFIC (Terrestrial)
- SS RR9.21/C/1111 or RR9.21/C/1114
- SS RR9.21/D/558 or RR9.21/D/561



Thank you!

ITU – Radiocommunication Bureau

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



List of assignments of for RR9.21 coordination

Assignments published in Part D

(Total 17 389 for 13 ADMs as of 10 November 2026)

adm	stn_cls	cnt	adm	stn_cls	cnt	adm	stn_cls	cnt	adm	stn_cls	cnt
ARS	FB	930	EGY	ML	923	LVA	FB	120	RUS	ML	2
ARS	ML	911	EST	FB	198	LVA	ML	1	SVN	FB	99
BLR	FB	9328	KAZ	FB	232	POL	FB	12	SVN	ML	165
CHN	FB	232	KAZ	ML	231	POL	ML	56	UKR	ML	8
CHN	ML	232	LTU	FB	272	RUS	AL	556	UZB	AL&FB	433
EGY	FB	931	LTU	ML	100	RUS	FB	921	UZB	ML	469

Assignments under coordination process

(Total 78 for 4 ADMs as of 10 November 2026)

adm	stn_cls	cnt	adm	stn_cls	cnt	adm	stn_cls	cnt	adm	stn_cls	cnt
LVA	FB	1	POL	FB	26	RUS	FB	23	UZB	FB&ML	18

Notification procedure

➢Notification for request for coordination

Administrations

ITU Radiocommunication Bureau

Creation of Notices (TerRaNotices)

Online Validation

Submission (WISFAT)

Final validation

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

Coordination under relevant provisions of Agreement

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

RR9.21 (Part D)

Return to ADM, if unfavorable



Case study on RR5.295A and 5.307A

➢RR 5.295A

5.295A *Additional allocation:* in 43 Region 1 countries (Albania, Germany, Andorra, Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Cyprus, Vatican, Croatia, Denmark, Estonia, Finland, France, Georgia, Greece, Hungary, Ireland, Iceland, Latvia, Liechtenstein, Lithuania, Luxembourg, North Macedonia, Malta, Moldova, Monaco, Montenegro, Norway, Uzbekistan, Kingdom of the Netherlands, Poland, Portugal, Türkiye, Slovakia, the Czech Republic, Romania, the United Kingdom, San Marino, Serbia, Slovenia, Sweden, Switzerland and Ukraine), the frequency band 470-694 MHz is allocated to the mobile, except aeronautical mobile, service on a secondary basis, subject to agreement obtained under No. **9.21**. For the protection of the broadcasting service, stations in the mobile service shall not create a field strength for more than 1% of the time at the highest of the clutter height or 10 m above ground level at the border of the territory of any other administration that exceeds the field strength value as calculated using § 4.1.3.2 of Annex 2 to the GE06 Agreement with regard to allowance for multiple interference, Table A.1.10 and the methodology given in the GE06 Agreement. These limits may be exceeded on the territory of any country whose administration has so agreed. This allocation shall in no way adversely affect the broadcast development or undermine new entries of the broadcasting service to the GE06 Plan. (WRC-23)

Case study on RR5.295A and 5.307A

➢RR 5.307A

5.307A *Additional allocation*: in 11 Region countries (Saudi Arabia, Bahrain, Egypt, the United Arab Emirates, Iraq, Jordan, Kuwait, Oman, Palestine*, Qatar and the Syrian Arab Republic), the frequency band 614-694 MHz is allocated to the mobile, except aeronautical mobile, service on a primary basis and identified for International Mobile Telecommunications (IMT) – see Resolution **224 (Rev.WRC-23)** subject to the agreement obtained under No. **9.21**. Stations in the mobile service shall not create a field strength for more than 1% of the time at the highest of the clutter height or 10 m above ground level at the border of the territory of any other administration that exceeds the field strength value as calculated using § 4.1.3.2 of Annex 2 to the GE06 Agreement with regard to allowance for multiple interference, Table A.1.10 and the methodology given in the GE06 Agreement. Stations in the mobile service of the countries listed in this footnote shall not cause harmful interference to, or claim protection from the existing and future broadcasting stations of the neighbouring countries operating in accordance with the GE06 Plan.

Case study on RR5.295A and 5.307A

➢RoP B6 Section 31bis.

3.1*bis* For the protection of the broadcasting (television) service in the frequency band 470-694 MHz in the context of the provisions of Nos. **5.295A** and **5.307A**, the coordination distances are calculated at a height of 10 m above ground level at the border of the territory of any other administration, using the propagation curves provided in the GE06 Agreement at 1% of time and 50% of locations with the coordination trigger field strengths as provided in § 4.1.3.2 of Annex 2 to the GE06 Agreement and given in Table 2*bis*.

TABLE 2*bis*

Service to be protected	Trigger field strength (dB(μV/m))	
	470-582 MHz	582-694 MHz
BS	13.229	15.229

Case study on RR5.312B and 5.314A

➢RR5.312B and 5.314A

5.312B The frequency band 698-960 MHz, or portions thereof, in Region 2, and the frequency band 694-960 MHz, or portions thereof, in Region 1, are identified for use by high-altitude platform stations as International Mobile Telecommunications (IMT) base stations (HIBS). This identification does not preclude the use of these frequency bands by any application of the services to which they are allocated and does not establish priority in the Radio Regulations. Resolution **213 (WRC-23)** shall apply. HIBS shall not claim protection from existing primary services. No. **5.43A** does not apply, see *resolves* 2 of Resolution **213 (WRC-23)**. Such use of HIBS in the frequency bands 694-728 MHz, 830-835 MHz and 805.3-806.9 MHz is limited to reception by HIBS. (WRC-23)

5.314A The frequency band 698-960 MHz, or portions thereof, in Australia, Maldives, Micronesia, Papua New Guinea, Tonga and Vanuatu, and the frequency bands 703-733 MHz, 758-788 MHz, 890-915 MHz and 935-960 MHz, or portions thereof, in China, India, Indonesia, Japan, Korea (Rep. of), Malaysia, the Philippines and Thailand are identified for use by high-altitude platform stations as International Mobile Telecommunications (IMT) base stations (HIBS). This identification does not preclude the use of these frequency bands by any application of the services to which they are allocated and does not establish priority in the Radio Regulations. Resolution **213 (WRC-23)** shall apply. HIBS shall not claim protection from existing primary services. No. **5.43A** does not apply, see *resolves* 2 of Resolution **213 (WRC-23)**. Such use of HIBS in the frequency bands 698-728 MHz and 830-835 MHz is limited to reception by HIBS. (WRC-23)

Case study on RR5.312B and 5.314A

➢Resolution 213 (WRC-23)

1 that use of the frequency band 694-960 MHz in accordance with Nos. **5.312B** and **5.314A** is subject to agreement obtained under No. **9.21** with respect to the affected aeronautical radionavigation service (ARNS) in countries listed in Nos. **5.312** and **5.323** based on the criteria contained in Annex 1 to this Resolution;

2 that HIBS operating in the frequency band 694/698-862 MHz shall not cause harmful interference to, nor claim protection from, the broadcasting service; where the GE06 Agreement applies, the power flux-density (pfd) level per HIBS shall not exceed −135.8 dB(W/(m^2 · MHz)), produced in the territory of other administrations, at a height of 10 metres unless explicit agreement of the affected administration is provided at the time of the notification of HIBS;

3 that, where the GE06 Agreement does not apply, the use of the frequency band 694/698-862 MHz by HIBS is subject to agreement obtained under No. **9.21** with respect to the broadcasting service in the territory of other administrations; the coordination threshold of a pfd level of −135.8 dB(W/(m^2 · MHz)), produced in the territory of other administrations, per HIBS shall be used at a height of 10 metres;

Case study on RR5.312B and 5.314A

➢Resolution 213 (WRC-23)

4.1 for the purpose of protecting the mobile service, including IMT terrestrial systems, in the territory of neighbouring administrations in the frequency band 694-960 MHz, the following limits shall apply:

– the pfd level per HIBS produced at the surface of the Earth in the territory of other administrations shall not exceed the following limit for the protection of IMT mobile stations, unless explicit agreement of the affected administration is provided:

-114 dB(W/(m^2 · MHz)) for $0° < \theta \leq 90°$

where θ is the angle of arrival of the incident wave above the horizontal plane, in degrees;

– the pfd level per HIBS produced at the surface of the Earth in the territory of other administrations shall not exceed the following limit for the protection of IMT base stations, unless explicit agreement of the affected administration is provided:

$-136 + 0.21\ (\theta)^2$ dB(W/(m^2 · MHz)) for $0° \leq \theta \leq 8.3°$

$-121.8 + 0.08\ (\theta)$ dB(W/(m^2 · MHz)) for $8.3° < \theta \leq 90°$

where θ is the angle of arrival of the incident wave above the horizontal plane, in degrees^2; s-26/

Case study on RR5.312B and 5.314A

➢Resolution 213 (WRC-23)

4.2 for the purpose of protecting mobile services including IMT terrestrial systems in the territory of Armenia, Azerbaijan, Belarus, the Russian Federation, Kazakhstan, Mongolia, Uzbekistan, Kyrgyzstan, the Democratic People's Republic of Korea, Tajikistan and Turkmenistan in the frequency band 694-960 MHz, the pfd level per HIBS produced at the surface of the Earth in the territory of the countries listed above in this *resolves* shall not exceed the following limits, unless explicit agreement of the affected administration is provided:

-150	dB(W/(m^2 · MHz))	for	$0° \le \theta < 11°$
$-150 + 0.3912\ (\theta\text{-}11)$	dB(W/(m^2 · MHz))	for	$11° \le \theta < 80°$
-123	dB(W/(m^2 · MHz))	for	$80° \le \theta \le 90°$

where θ is the angle of arrival of the incident wave above the horizontal plane, in degrees;

Case study on RR5.312B and 5.314A

➢RoP on 5.312B and 5.314A

5.312B and 5.314A

1 These provisions stipulate that the use of the frequency bands 694-960 MHz (No. **5.312B**) and 698-960 MHz (No. **5.314A**) by high-altitude platform stations for International Mobile Telecommunication (IMT) base stations (HIBS) shall be in accordance with Resolution **213 (WRC-23)**, including the power flux-density (pfd) limits listed in *resolves 2, 3, 4.1, 4.2* and *4.3* of that Resolution.

2 Considering that neither these RR provisions nor Resolution **213 (WRC-23)** specify the propagation prediction model to be used for the calculation of pfd levels produced by HIBS, the Board decided that Recommendation ITU-R P.528-5 is to be used for the calculation of those pfd levels at 1% of time over a smooth-Earth path, produced at a height of:

– 10 m in application of *resolves 2* and *3*; and

– 1.5 m in application of *resolves* 4.1, 4.2 and 4.3.

Case study on RR5.457F and 5.480A

➢RR 5.457F and 5.480A

5.457F In Brazil and Mexico, the frequency band 6 425-7 125 MHz is identified for the terrestrial component of International Mobile Telecommunications (IMT). The use of this frequency band for the implementation of IMT is subject to seeking agreement under No. **9.21** with neighbouring countries. This identification does not preclude the use of this frequency band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations. Resolution **220 (WRC-23)** applies.

5.480A In the following countries in 12 Region 2 countries (Brazil, Colombia, Costa Rica, Cuba, the Dominican Republic, Ecuador, Guatemala, Jamaica, Mexico, Paraguay, Peru and Uruguay), the frequency band 10-10.5 GHz is identified for the implementation of the terrestrial component of International Mobile Telecommunications (IMT). The implementation of this identification in Mexico is subject to seeking agreement with the United States under No. **9.21**. The use of the frequency band 10-10.5 GHz by IMT stations in the mobile service shall not claim protection from systems in the radiolocation service. This identification does not preclude the use of this frequency band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations. Resolution **219 (WRC-23)** applies. (WRC-23)

Case study on RR5.457F and 5.480A

➢RoP B6 Sections 3.11 and 3.12

3.11 For the protection of the fixed and mobile services in the frequency band 6 425-7 125 MHz from IMT, in the context of the provisions of No. **5.457F**, a coordination trigger distance of 200 km with respect to the border of a neighbouring country is used.

3.12 For the protection of stations in the fixed and radiolocation services in the frequency band 10-10.5 GHz from IMT as indicated in Column 3 of Table 1, in the context of the provisions of No. **5.480A**, a coordination trigger distance of 500 km for IMT stations of Mexico with respect to the border of the United States is used.