

ITUEvents

ITU World Radiocommunication Seminar 2018

3-7 December 2018
Geneva, Switzerland

www.itu.int/go/ITU-R/WRS-18



Frequency plans and coordination procedures for non-broadcasting services

By Karlis Bogens
Head, Fixed and Mobile Services
Division,
Terrestrial Services Department,
Radiocommunication Bureau

ITU HQ Geneva,
3 December, 2018

Scope and outline of presentation

■ Scope of terrestrial services other than broadcasting

FXM

- Fixed service
- Mobile services (land, aeronautical and maritime mobile)
- Radionavigation services (aeronautical and maritime radionavigation services)
- Radiolocation, meteorological aids, standard frequency and time signal

■ Outline of presentation:

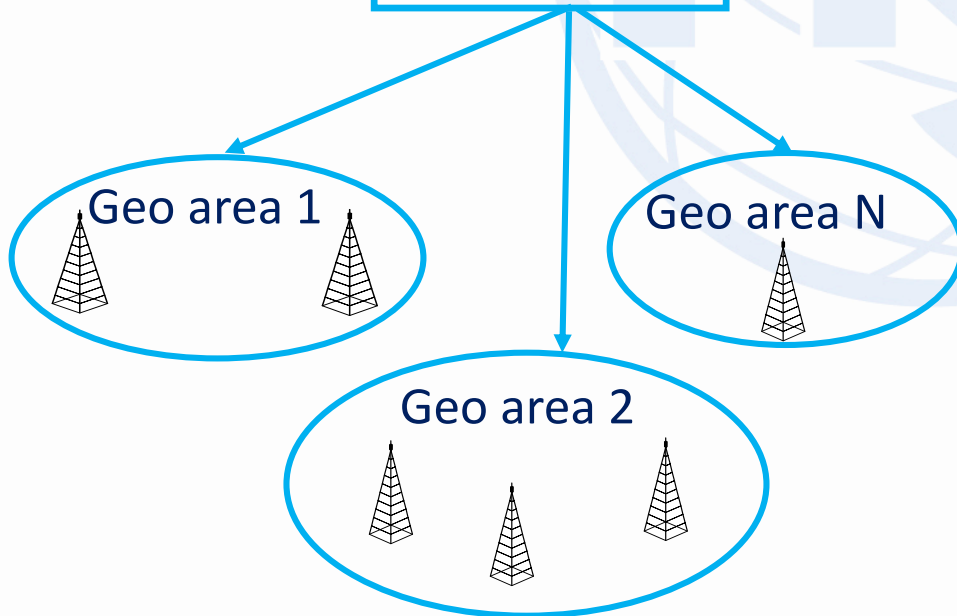
- Frequency allotment and assignment plans for FXM
- Coordination of FXM assignments
- Examination of FXM assignments under RR Article 11

Frequency plans for FXM services

Allotment Plans $\Leftarrow \Rightarrow$ **Assignment Plans**

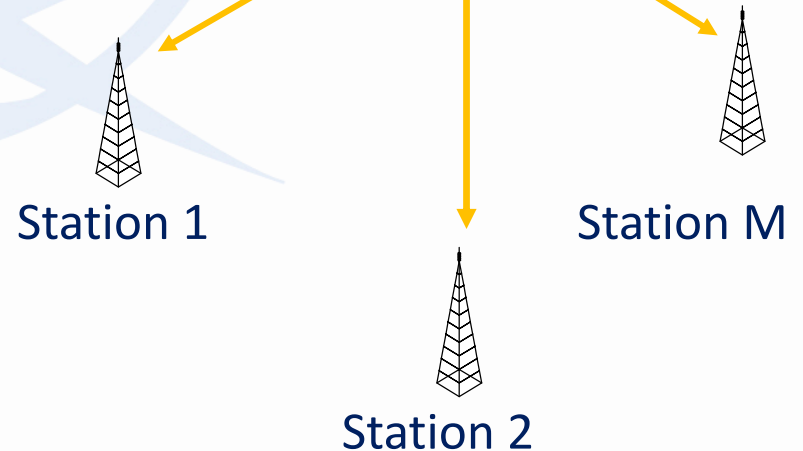
Allotment
↓
to geographical areas

f_{YYY}



Assignments
↓
to stations

f_{XXX}



Frequency plans for FXM services

Worldwide frequency allotment plans



AP25 - Plan for maritime mobile service, HF
(4000 – 27 500 kHz)



AP26 - Plan for aeronautical mobile (off-route)
service, HF (3025 – 18030 kHz)



AP27 - Plan for aeronautical mobile (route)
service, HF (2850 – 22000 kHz)



Regional frequency allotment plan



Maritac-19

GE85-MM-R1: Frequency allotment plan for national channels in Digital
Selective Calling (DSC) system in bands
435-526.5 kHz and 1 606.5 - 2 160 kHz



Allotment plan for the maritime mobile service (AP25 to RR)



- Worldwide allotment plan, maritime mobile service, 4000-27500 kHz
 - 240 channels; allotment areas, channel bandwidth – 2,8 kHz, class of emission - J3E or J2D, maximum peak envelope power - 10 kW



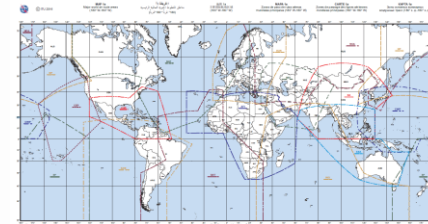
19 792.4	ALS	
(19 791)	CHN	
	E	
(1813)	F	
	HWA	
	IND E	
	IND W	
	J	
	PTR	
	S	ADD
	TUR	
	USAE	
	USA SO	
	USA W	

Channel 1813 is allotted to allotment areas IND E and IND W . Administration of India can assign this channel to any coast station located in allotment areas IND E and IND W.

Allotment plans for the aeronautical mobile services (AP26/AP27 to RR)



- Worldwide plan for aeronautical mobile off-route service
3 025 - 18 030 kHz / 10 sub-bands/ Carrier frequencies /allotment areas
 - Maximum bandwidth - 2.8 kHz, Classes of emission - J3E; A1A; A1B; F1B(A,H)2(A,B); (R,J)2(A,B,D); J(7,9)(B,D,X)
 - Mean effective radiated power: 1 kW (aeronautical stations)
50 W (aircraft stations)



- Worldwide plan for aeronautical mobile route service
2 850 - 22 000 kHz / Carrier frequencies / geographical areas (MWARA, RDARA, VOLMET areas)
 - Classes of emission: J3E, H2B, J7B, J2D, J9X (A1A/A1B) and F1A/F1B, Frequency separation - 3 kHz, multiple to 1 kHz
 - Maximum peak envelope power in AP27/60, e.g. (J3E, H2B, J7B, JXX):
6 kW (aeronautical stations)
400 W (aircraft stations)

Frequency plans for FXM services

Regional frequency assignment plans



GE85-R1-MAR: Plan for maritime mobile service, MF bands



GE85-R1-AER: plan for aeronautical radionavigation service, MF bands



GE85-EMA: plan for maritime radiobeacons, European maritime area 283.5 - 315 kHz



The List of frequency assignments for primary terrestrial services other than broadcasting in the planning area and bands **(174-230 MHz/ 470-862 MHz)** governed by the **Regional Agreement GE06**

Region 1



GE06 Planning Area



Frequency assignment plan GE85-R1-AER

- Scope
 - Plan for aeronautical radionavigation service in Region 1
 - Frequency bands: 415 – 435 kHz, 510 – 526.5 kHz
 - Takes into account also maritime mobile service stations
- Characteristics
 - 34 channels, spacing - 1 kHz (0.5 kHz exceptionally)
 - Classes of emission – A1A, A2A
- Coordination procedure
 - Submission of AP4 information to the BR, publication of the complete information in BR IFIC
 - Coordination with affected administrations having assignments in conformity with the Plan
 - Informing the BR about the results (90+15 days)
 - Successful coordination - recording in the Plan



FXM frequency plans (summary)



Plan Name/Type	Radiocommunication service	Planned bands	Planning area
AP 25 (Allotment)	Maritime mobile (Coast radiotelephone stations)	4000 - 27500 kHz	Worldwide
AP26 (Allotment)	Aeronautical Mobile (OR)	3025 - 18030 kHz	Worldwide
AP27 (Allotment)	Aeronautical Mobile (R)	2850 - 22000 kHz	Worldwide
GE85-MM-R1 (Allotment)	Maritime Mobile (DSC)	435 - 526.5 kHz 1 606.5 - 2 160 kHz	Region 1
GE85-R1-MAR (Assignment)	Maritime Mobile	415 - 495 kHz 505 - 526.5 kHz 1 606.5 - 1 625 kHz 1 635 - 1 800 kHz 2 045 - 2 160 kHz	Region 1
GE85-R1-AER (Assignment)	Aeronautical Radionavigation	415 - 435 kHz 505 - 526.5 kHz	Region 1
GE85-EMA (Assignment)	Maritime Radionavigation	283.5 - 315 KHz	European Maritime Area
GE06 List (Assignment)	e.g. Fixed / Mobile / Radionavigation etc.	174-230 MHz 470-862 MHz	In parts of Regions 1 and 3

Coordination of FXM assignments (1)

Frequency Coordination

Mandatory coordination

Assignments to be coordinated prior to bringing into use, e.g. if subject to RR Article 9

Voluntary coordination

Direct coordination between administrations concerned without involvement of the Bureau

RR Article 9

RR 9.16, RR 9.18, RR 9.19 and RR 9.21

e.g. GE85-R1-MAR, GE85-EMA

Non-planned services in bands and areas governed by Regional Agreements

RR Appendix 5

Identification affected administrations for coordination

e.g. RR Appendix 7

Determination of coordination area for RR 9.16 and RR 9.18



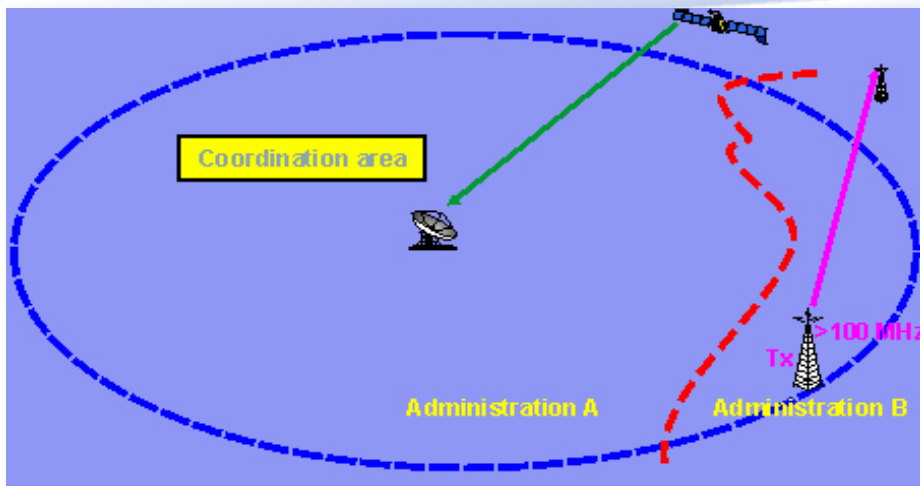
Coordination of FXM assignments (2)

Mandatory coordination cases under RR Article 9
RR 9.16, RR 9.18,
RR 9.19 and RR 9.21

RR 9.21



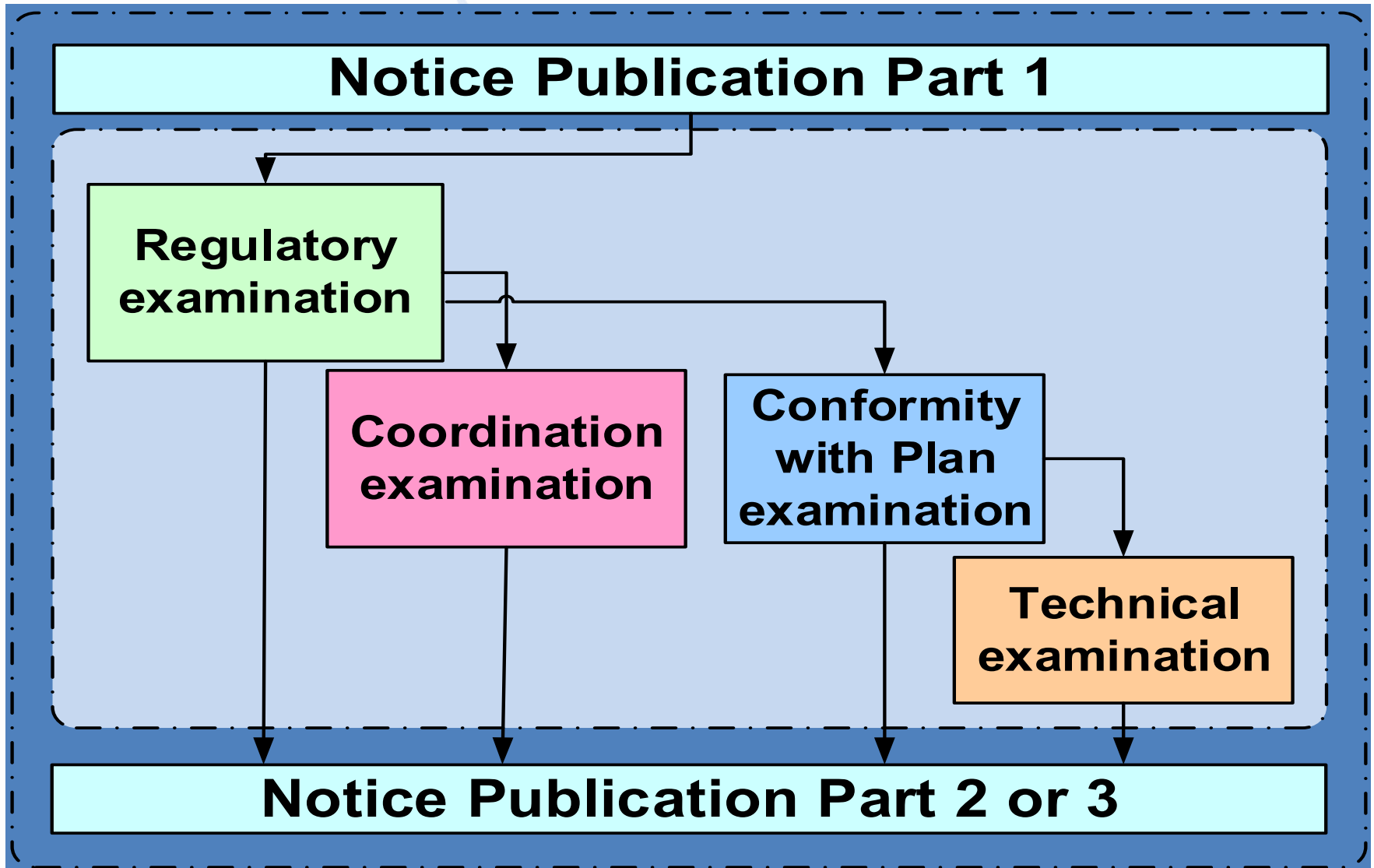
RR 9.16/RR 9.18



RR 9.19



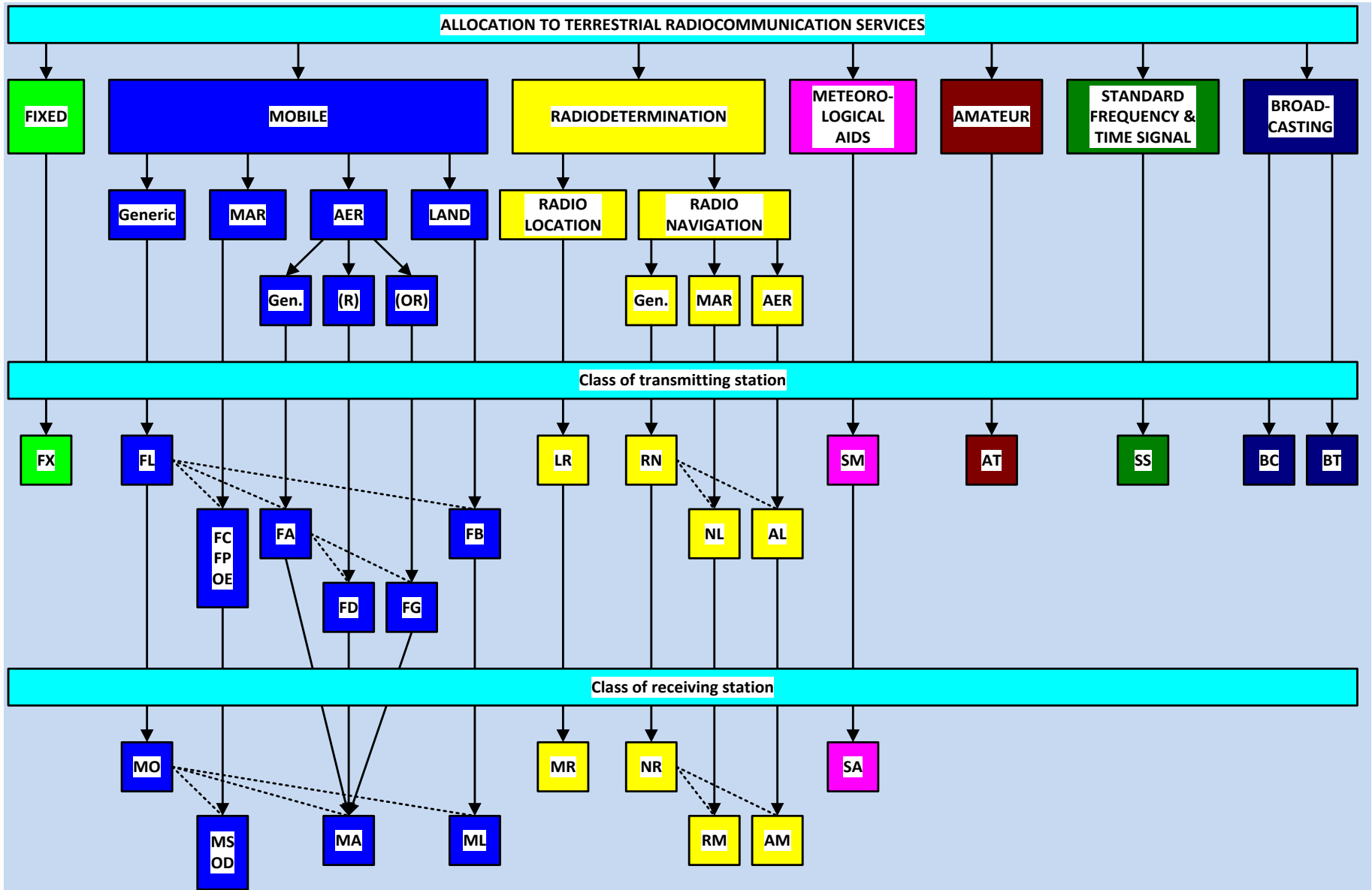
Examination of FXM assignments under RR Article 11



Regulatory examination RR 11.31 (1)

- **Table of frequency allocations, including footnotes:**
 - Notified band within the band allocated to the service
 - Receiving point is in country where allocation exists
 - Category of allocation: primary or secondary
 - Successful application of RR **9.21** (RR **11.31.1**)
 - ✓ for allocations to mobile service and/or identifications for IMT subject to RR **9.21** (470-694/698 MHz, 694 – 790 MHz (Region 1), 1427-1518 MHz, 3300-3400 MHz, 3400-3700 MHz and 4800 – 4990 MHz)
 - ✓ RoP (e.g. RR **5.316B**, RR **5.341A**, Section **B6** etc.)
 - ✓ **CR/391** Nature of Service **IM** – IMT station in the mobile service (to enable the examination of the conditions associated with IMT)
- **Other RR provisions:**
 - Power limits RR **21.3** – RR **21.5A**
 - Specific requirements for services (e.g. classes of emission, channeling arrangements, power limits for MMS in HF bands)

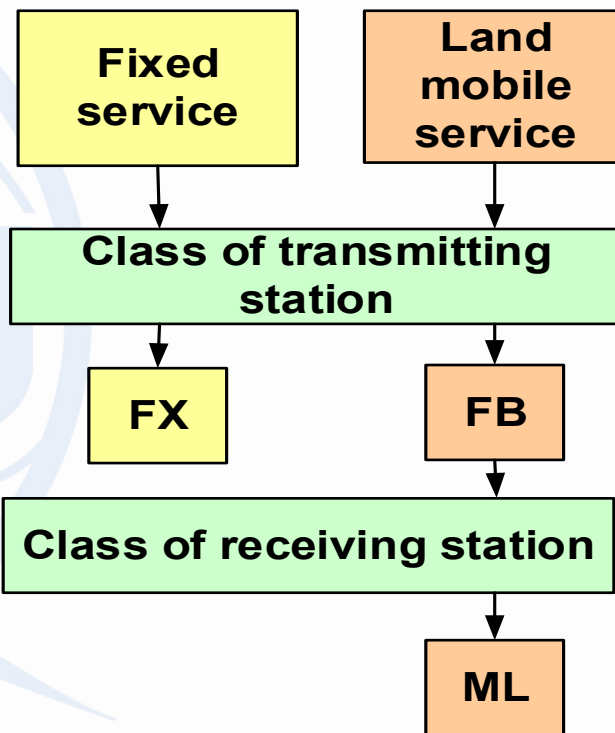
Relation between radio services and classes of stations



Regulatory examination (3)

Permitted classes of station

Allocation to services		
Region 1	Region 1	Region 1
24 000-24 450 kHz	FIXED LAND MOBILE	



CHAPTER II - Frequency RRR-7

Section IV - Table of Frequency Allocations
(See No. 2.3.)

8.2-101 kHz

Allocation to services		
Region 1	Region 2	Region 3
Below 8.3 (See also 8.2)		
8.3-9	METEOROLOGICAL AIDS 5.543 5.548 5.54C	
9-11.9	METEOROLOGICAL AIDS 5.54A	
11.141	RADIONAVIGATION	
14-14.98	FIXED MARITIME MOBILE 5.57	
15.5-15.6		
19.98-20.08	STANDARD FREQUENCY AND TIME SIGNAL (See 8.2)	
20.06-79	FIXED MARITIME MOBILE 5.57 3 M 5.18	
50.72 RADIONAVIGATION 5.40	50.76 FIXED MARITIME MOBILE 5.57 MARITIME RADIO-NAVIGATION 5.40 Radiotelex	50.72 RADIONAVIGATION 5.40 Fixed Maritime mobile 5.57 3.19
52.84 FIXED MARITIME MOBILE 5.57 RADIONAVIGATION 5.40		52.84 FIXED MARITIME MOBILE 5.57 RADIONAVIGATION 5.40
52.8		
52.84 RADIONAVIGATION 5.40		52.84 RADIONAVIGATION 5.40 Fixed Maritime mobile 5.57 2.19
86.29 FIXED MARITIME MOBILE 5.57 RADIONAVIGATION 5.40		86.29 FIXED MARITIME MOBILE 5.57 RADIONAVIGATION 5.40
1.56	1.81	
99-101	RADIONAVIGATION 5.42 Fixed 5.61	

- 43 -

Regulatory examination (4)

Allocation to services		
Region 1	Region 2	Region 3
322-328.6 MHz	FIXED MOBILE RADIO ASTRONOMY 5.149	
<p>Example for FIXED service with <u>Favourable</u> finding</p> <p>Class of station FX</p> <p>Assigned frequency: 327.0 MHz / fmin: 325.5 MHz/ fmax: 328.5 MHz</p> <p>Bandwidth 3 MHz</p>		
328.6-335.4 MHz	AERONAUTICAL RADIONAVIGATION 5.259	
<p>Example for FIXED service with <u>Unfavourable</u> finding</p> <p>Class of station FX</p> <p>Assigned frequency 328.0 MHz / fmin: 326.5 MHz/ fmax: 329.5 MHz</p> <p>Bandwidth 3 MHz</p> <p>Reason for unfavorable finding: <u>bandwidth overlaps with non-allocated band</u></p>		

Regulatory examination (5)

Protection of space services in uplink (RR Article 21 power limits on transmitters in fixed and mobile services):

RR21.3: e.i.r.p. ≤ 55 dBW

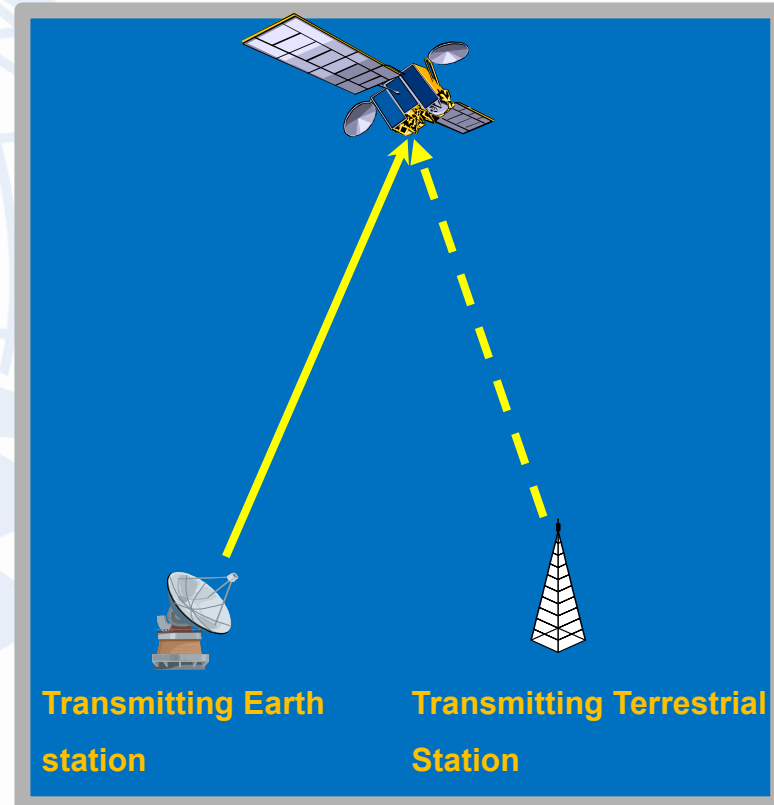
RR21.4 (protection of GSO): e.i.r.p.:
 ≤ 47 dBW within 0.5° of GSO
 $\leq 47 - 55$ dBW

between 0.5° and 1.50° of GSO

RR21.5: Power to antenna:
 ≤ 13 dBW in bands 1- 10 GHz
 ≤ 10 dBW above 10 GHz

RR21.5A: Power to antenna
 ≤ -3 dBW for FS in 18.6- 18.8 GHz

RR21.3 – RR21.5A: in bands of Table 21-2



Coordination examination-cases RR 11.32 (1)

RR 9.16, RR 9.18: coordination with receiving earth stations in the shared bands

RR 9.19: vis-à-vis typical stations in the broadcasting-satellite service

Coordination examination-cases **RR 11.32**

RR 9.21: in frequency bands subject to agreement obtained under **RR 9.21**

GE85-EMA, GE85-M, GE89 and RJ88: coordination of non-planned services in bands and areas governed by regional agreements

Coordination examination (2)

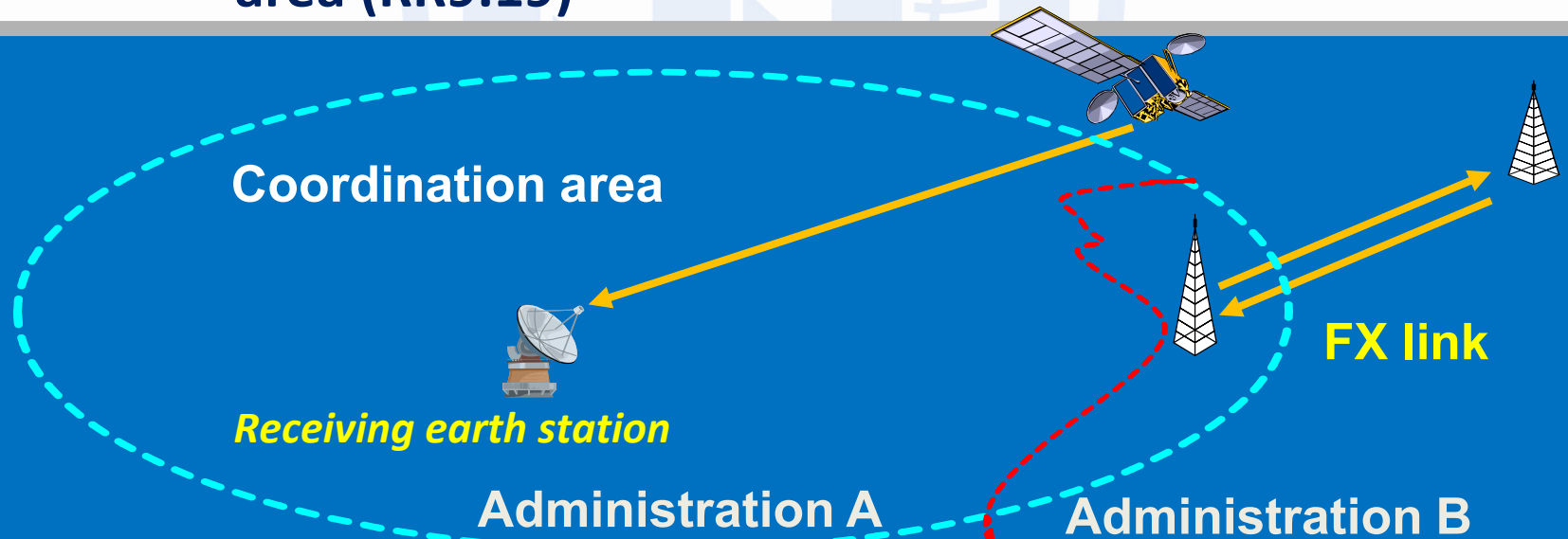
- **Sharing between terrestrial and space services**
 - More than 60 frequency bands above 100 MHz allocated with equal rights to terrestrial and space services
- **Protection of space services from terrestrial services:**
 - Protection of receiving earth stations and BSS typical receiving earth stations from terrestrial transmitters (downlink) -> coordination

7 250-8 500 MHz

Allocation to services		
Region 1	Region 2	Region 3
8 025-8 175	EARTH EXPLORATION-SATELLITE (space-to-Earth) FIXED FIXED-SATELLITE (Earth-to-space) MOBILE 5.463 5.462A	

Coordination examination (3)

- **Protection of space services in downlink**
 - Protection of specific receiving earth station:
coordination of terrestrial transmitters located within coordination area of an earth station (RR9.16, RR9.18)
 - Protection of BSS typical receiving earth stations:
coordination of terrestrial transmitters vs. BSS service area (RR9.19)



Coordination of terrestrial transmitter with receiving earth station is necessary if there is frequency overlap and terrestrial station is located within coordination area

Conformity with Plan examination (1)

Worldwide allotment plans for maritime mobile and aeronautical mobile services (AP25, AP26 and AP27)

Notified frequency
is in allotted
channel listed in
the Plan

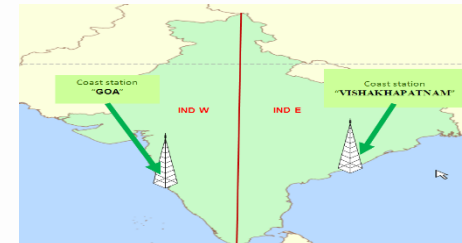
Notified
geographical area
corresponds to a
Plan allotment

Receiving area is
within the
allotment area

AP25



19 792.4	ALS		
(19 791)	CHN		
	E		
(1813)	F		
	HWA		
	INDE		
	INDW		
	J		
	PTR		
	S	ADD	
	TUR		
	USAE		
	USA SO		
	USA W		



Regional assignment plans (GE85-R1-MAR, GE85-R1-AER, GE85-EMA and GE06) -> notified parameters correspond to the parameters recorded in a Plan

Technical examination

Applies to AP26 and AP27 - if a notice is in conformity with the technical principles of allotment plan, but not in conformity with the allotment plan

AP26 - notice is examined with respect to the allotments in Part III of **AP26** (RR 11.39C)

AP27 - notice is examined whether the protection specified in **AP27** is afforded to the allotments in the Plan and to assignments already recorded in the Master Register with a favourable finding (RR 11.39A)

RR provisions for use of assignments to terrestrial service stations

Article 4: general rules for assignment and use of frequencies

Article 5: frequency allocations - assignments should be in conformity with Table of Frequency Allocations and footnotes

Article 9: coordination procedures - assignments should be coordinated prior to bringing into use, if subject to Article 9

Appendix 5: identification affected administrations for coordination

Appendix 7: determination of coordination area (for RR9.16, RR9.18)

Article 11: notification and recording of assignments

Appendix 4: characteristics of assignments to be notified for recording in the Master Register or used in coordination

Article 8: status of assignments recorded in the Master Register

Article 21: sharing between terrestrial and space services – power limits on transmitters in fixed and mobile services

Other provisions: Art. 24 (FS), Art. 43 (AMS), Art. 51, 52 (MMS), AP25 (MMS), AP26 (AM(OR)S), AP27 (AM(R)S), etc.



Thank you

**Please remember to visit
the WRS-18 Exhibition
located at the entrance of the
ITU Montbrillant building**