Frequency plans and coordination procedures for non-broadcasting services

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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

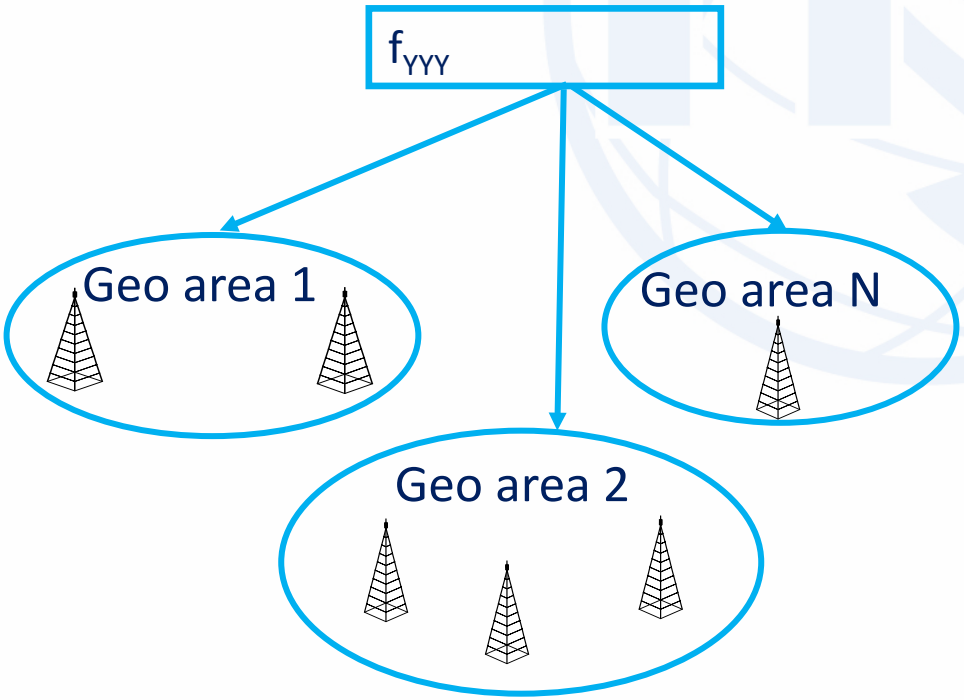
- Outline of presentation:
  - Frequency allotment and assignment plans for FXM
  - Coordination of FXM assignments
  - Examination of FXM assignments under RR Article 11

Frequency plans for FXM services

Allotment Plans ◀▶ Assignment Plans

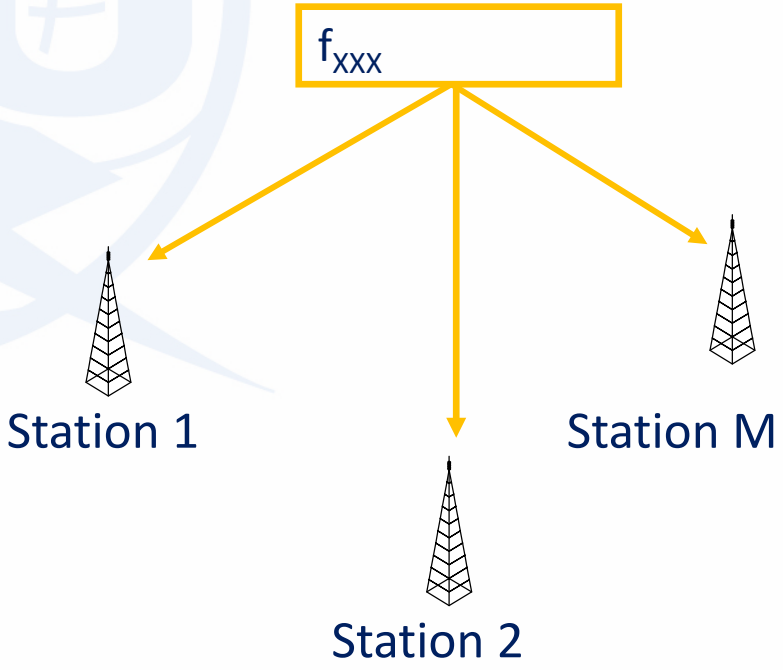
Allotment

to geographical areas



Assignments

to stations



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

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

Frequency plans for FXM services

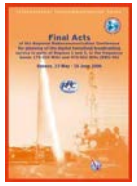
Regional frequency assignment plans

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

Region 1

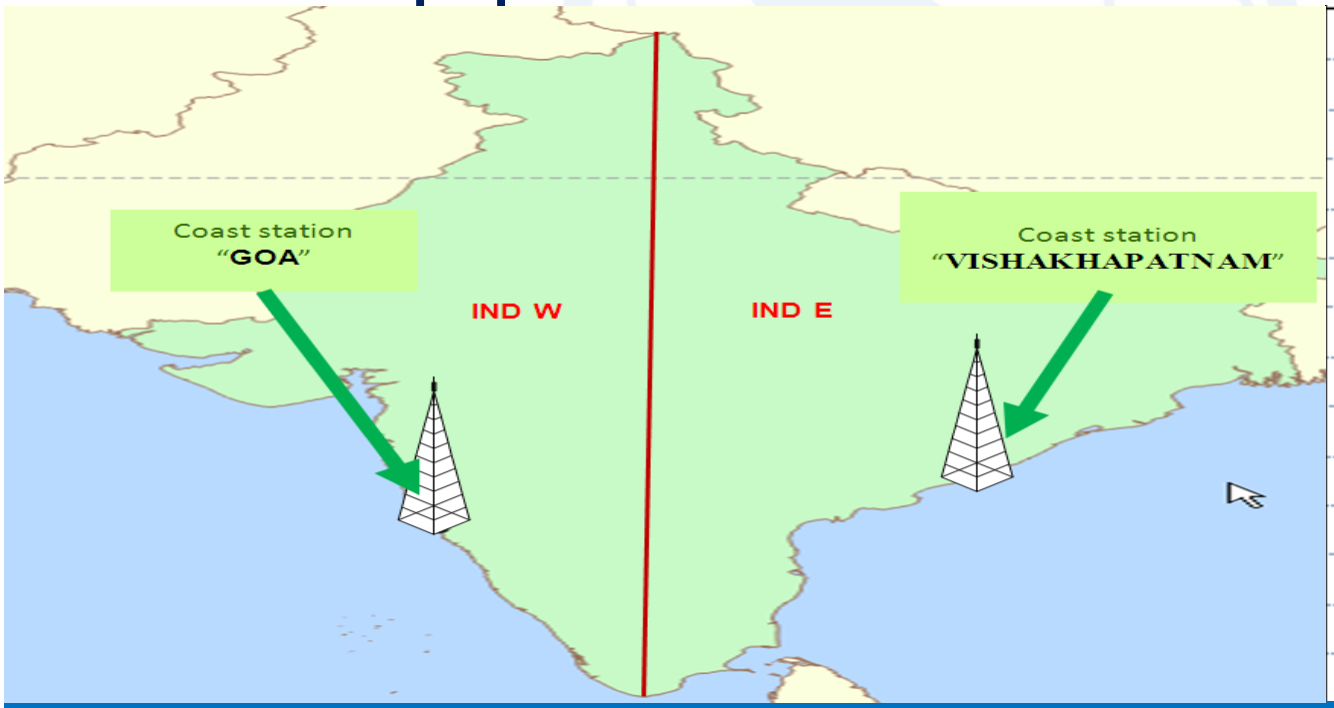


The List of frequency assignments for primary terrestrial services other than broadcasting in the planning area and bands (**174-230 MHz/ 470-862 MHz**) governed by the **Regional Agreement GE06**

GE06 Planning Area

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	
	USA E	
	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 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 AP**27/60**, e.g. (J3E, H2B, J7B, JXX): 6 kW (aeronautical stations)
    400 W (aircraft stations)

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 AP**4** 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)

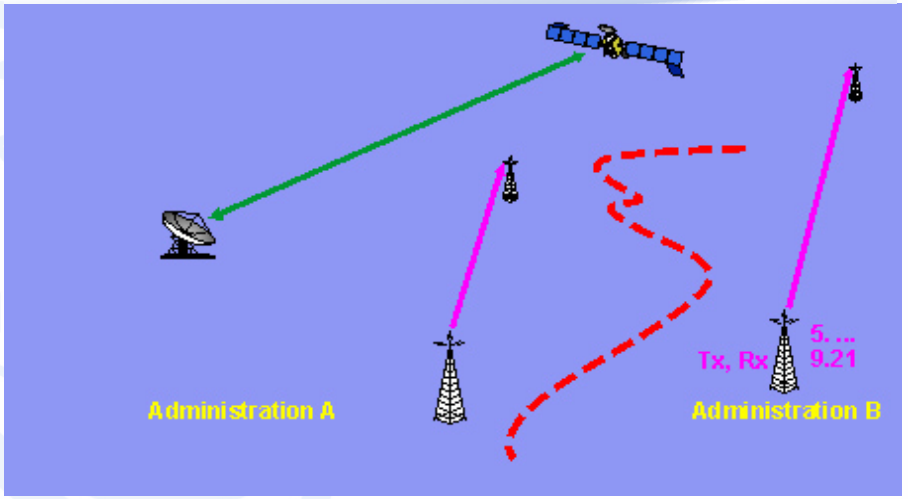
- Coordination of frequencies is a means of insuring interference free operation of radio stations
- Mandatory and voluntary coordination
  - mandatory: assignments to be coordinated prior to bringing into use, e.g. if subject to RR Article 9
  - voluntary: direct coordination between administrations concerned without involvement of the Bureau
- RR Article 9 - basic provisions for terrestrial stations: RR9.16, RR9.18, RR9.19 and RR9.21
  - Appendix 5: identification affected administrations for coordination
  - Appendix 7: determination of coordination area (for RR9.16 and RR9.18)

Coordination of FXM assignments (2)

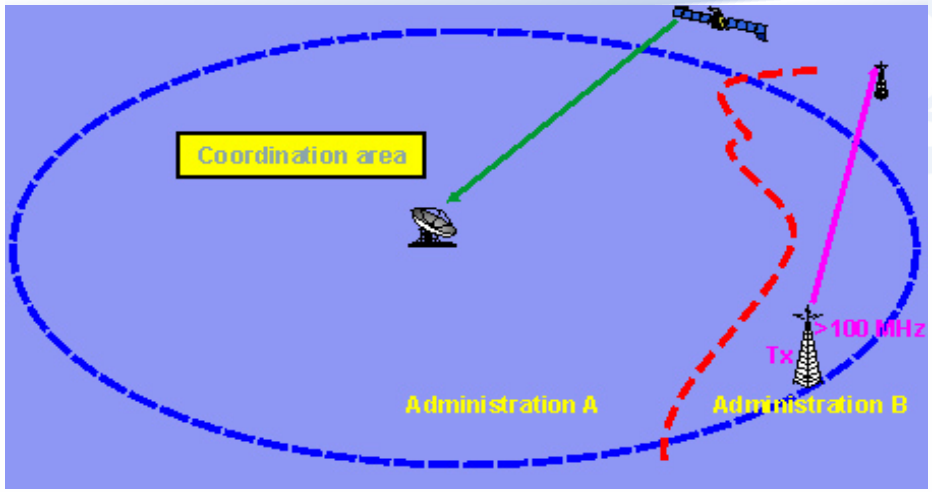
Mandatory coordination cases under RR Article 9

RR9.16, RR9.18, RR9.19 and RR9.21

RR9.21

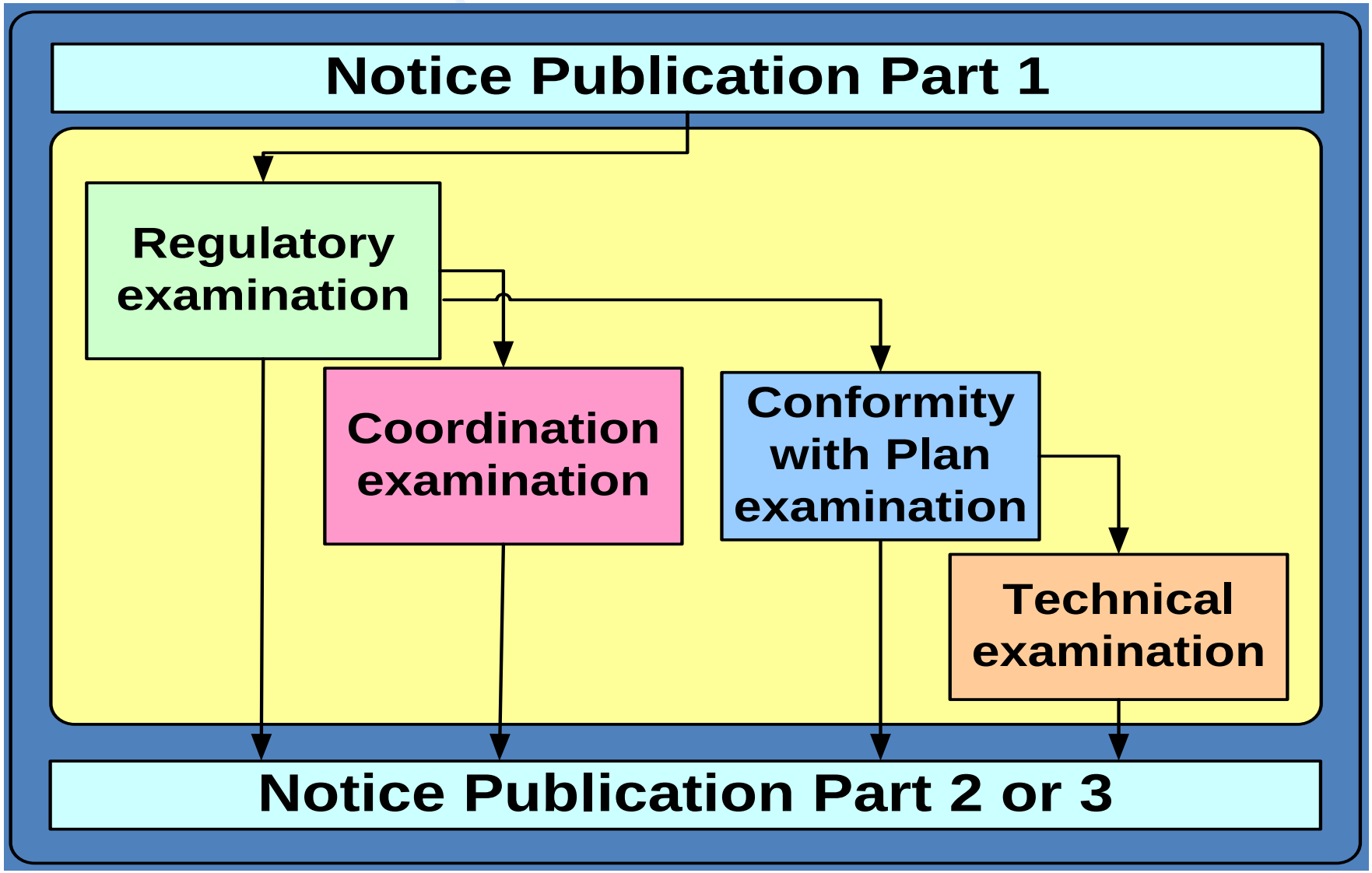


RR9.16/RR9.18



RR9.19

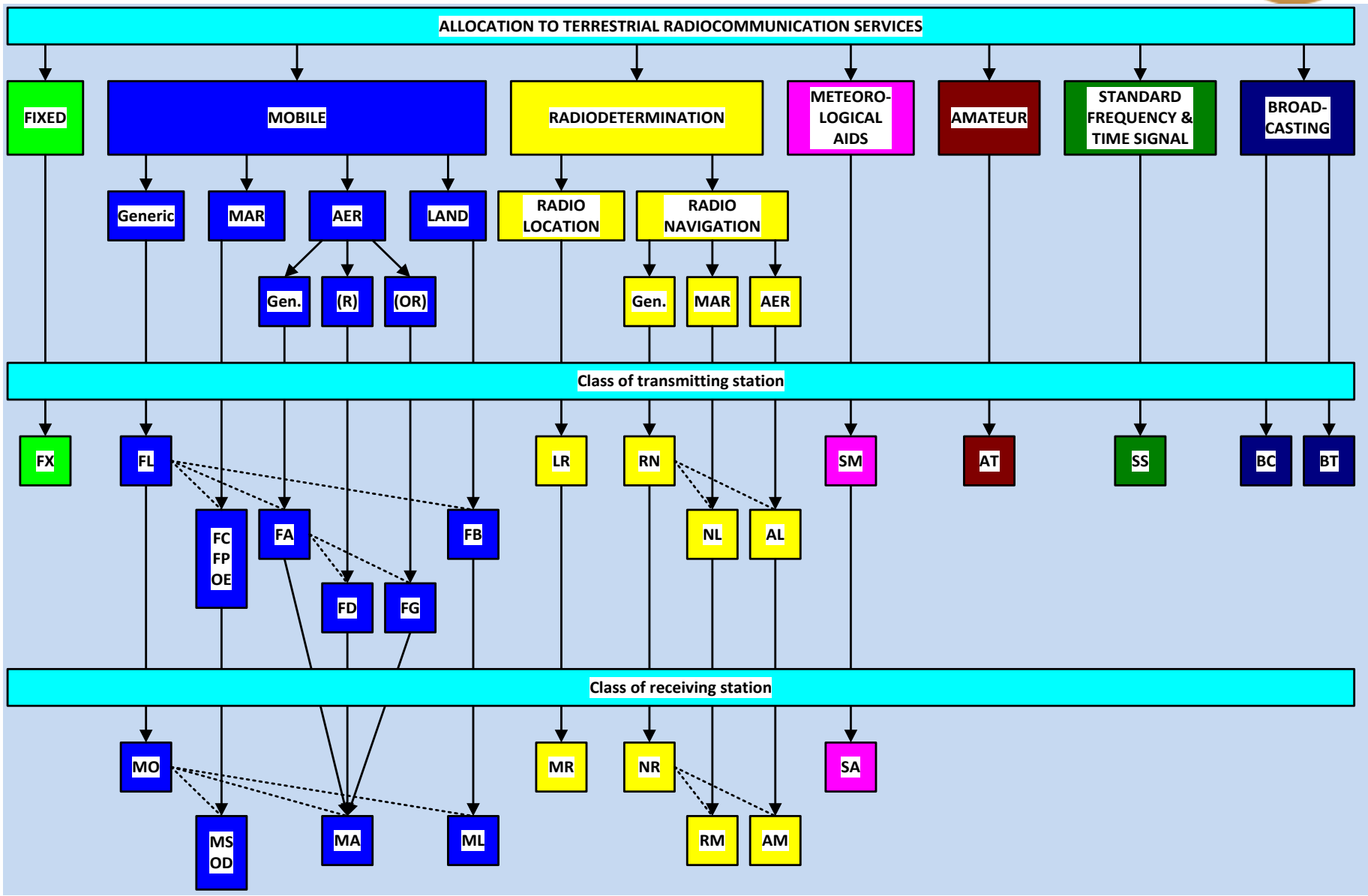
Examination of FXM assignments under RR Article 11



Regulatory examination (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
  - Coordination procedure of RR**9.21**, when applicable
    - ✓ Increasing importance of frequency bands recently approved by WRC-15 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)
    - ✓ New 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)

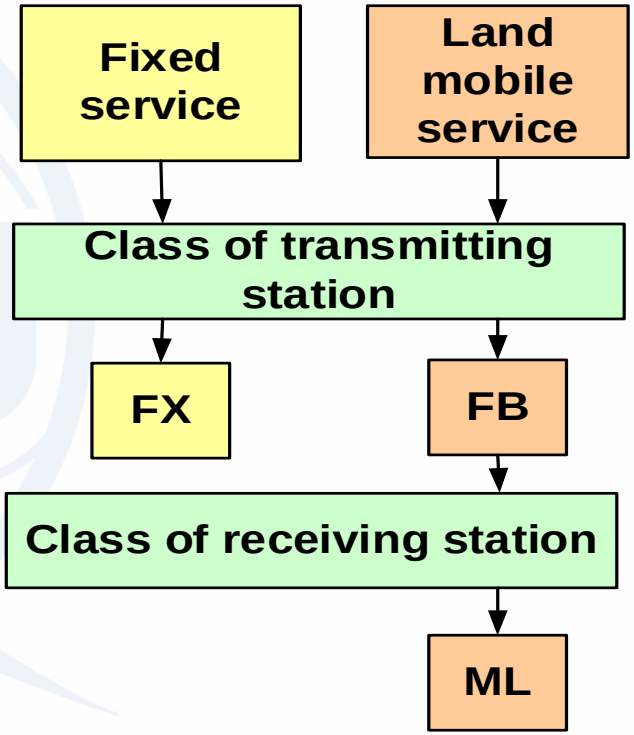
Relation between radio services and classes of stations

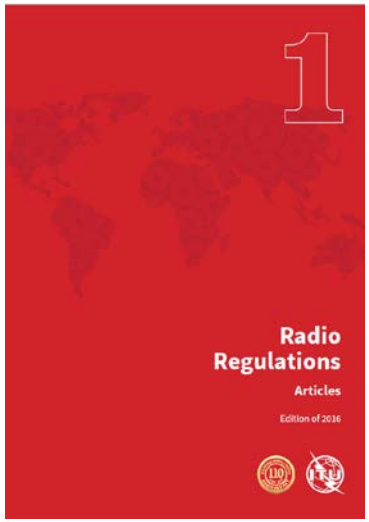


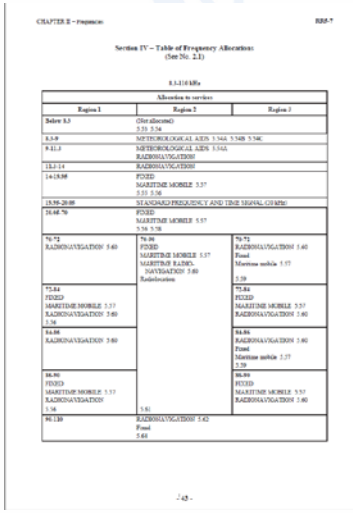
Regulatory examination (3)

Permitted classes of station

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







Regulatory examination (4)

Allocation to services			
Region 1		Region 2	Region 3
322-328.6	FIXED MOBILE RADIO ASTRONOMY 5.149		
328.6-335.4	AERONAUTICAL RADIONAVIGATION 5.259		

Example for FIXED service with Favourable finding

Class of station FX

Assigned frequency: 327.0 MHz / fmin: 325.5 MHz/ fmax: 328.5 MHz

Bandwidth 3 MHz

Example for FIXED service with Unfavourable finding

Class of station FX

Assigned frequency 328.0 MHz / fmin: 326.5 MHz/ fmax: 329.5 MHz

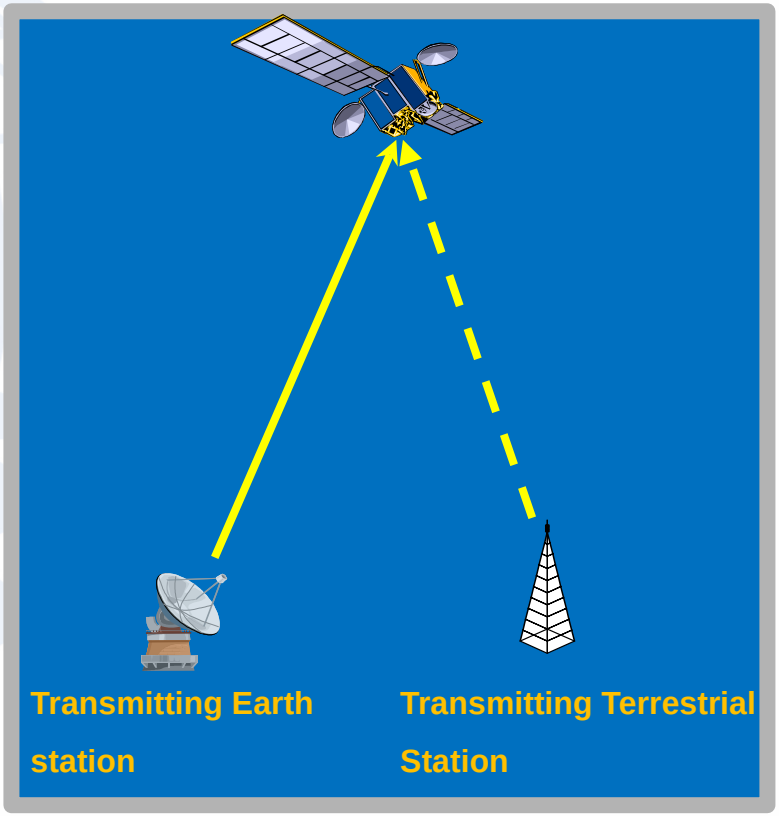
Bandwidth 3 MHz

Reason for unfavorable finding: bandwidth overlaps with non-allocated band

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
  - ≤ 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 (1)

- RR9.16, RR9.18: coordination with receiving earth stations in the shared bands
- RR 9.19: vis-à-vis typical stations in the broadcasting-satellite service
- 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

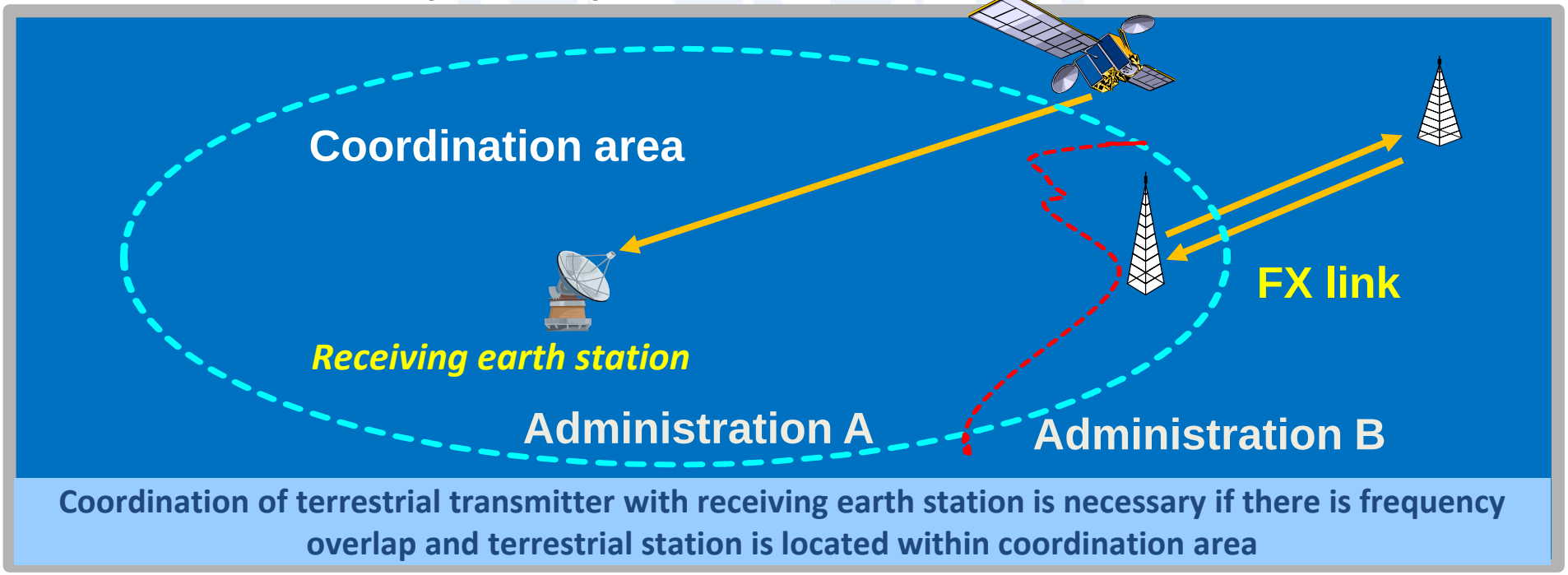
7 250-8 500 MHz

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)**

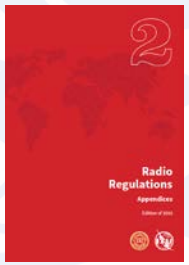


Coordination of terrestrial transmitter with receiving earth station is necessary if there is frequency overlap and terrestrial station is located within coordination area

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



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- **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 (No. 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 (No. 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 inconformity 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 RR**9.16**, RR**9.18**)
- **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), AP**25** (MMS), AP**26** (AM(OR)S), AP**27** (AM(R)S), etc.