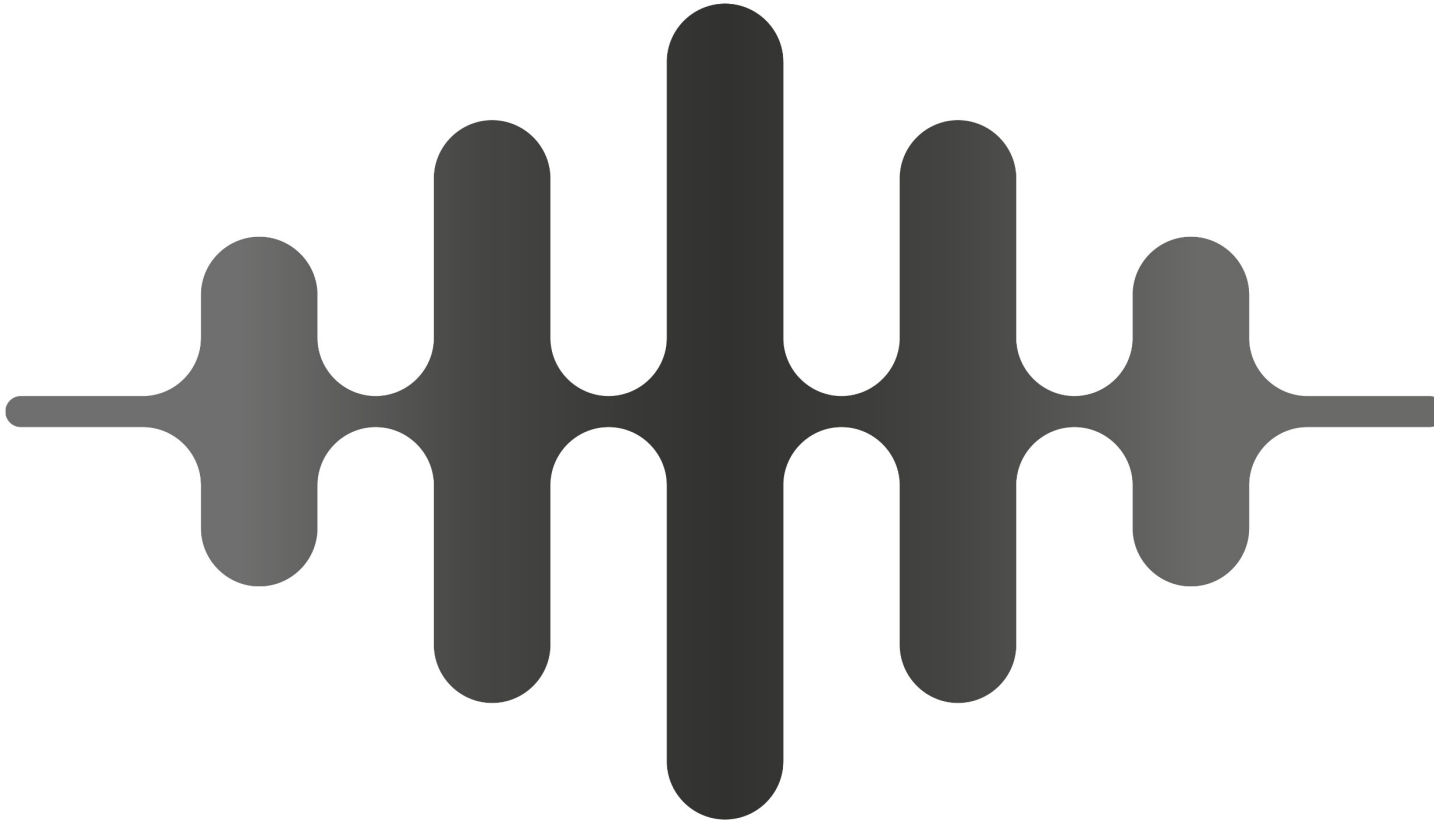
32ND ITU WORLD
RADIOCOMMUNICATION SEMINAR

# ITUWRS
# GENEVA2026

**7–11 December 2026**
**Geneva, Switzerland**

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



Organized by:

ITU

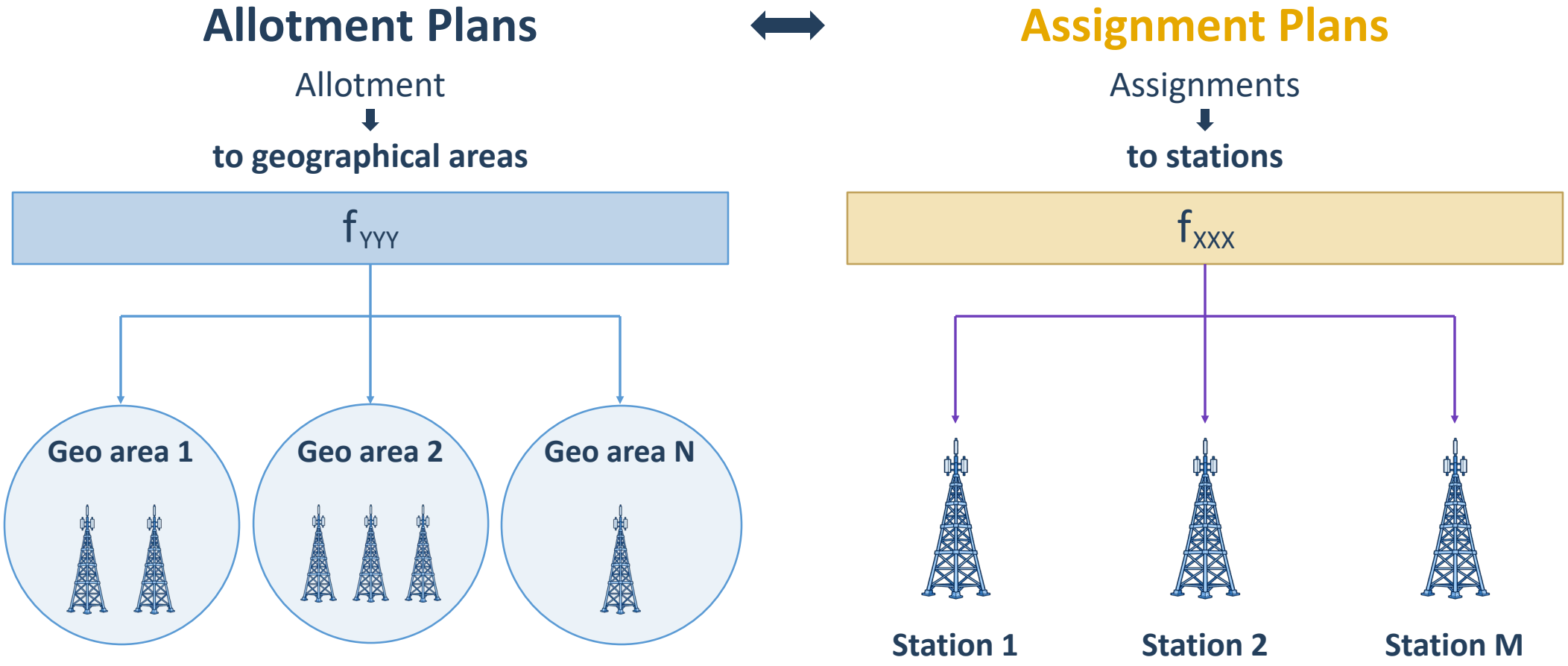
# Frequency plans and coordination procedures for fixed and mobile services Cross-border coordination issues for fixed and mobile services

ITU BR/TSD

# Contents


1. FXM frequency plans
2. General aspects of coordination
3. Mandatory Coordination of FXM assignments
   - Coordination under Nos. 9.16 & 9.18
   - Coordination under No. 9.19
   - Coordination under other provisions of the RR
4. Voluntary Coordination of FXM assignments
5. Conclusions

# Frequency plans for FXM services



# Frequency allotment 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

**Region 1**



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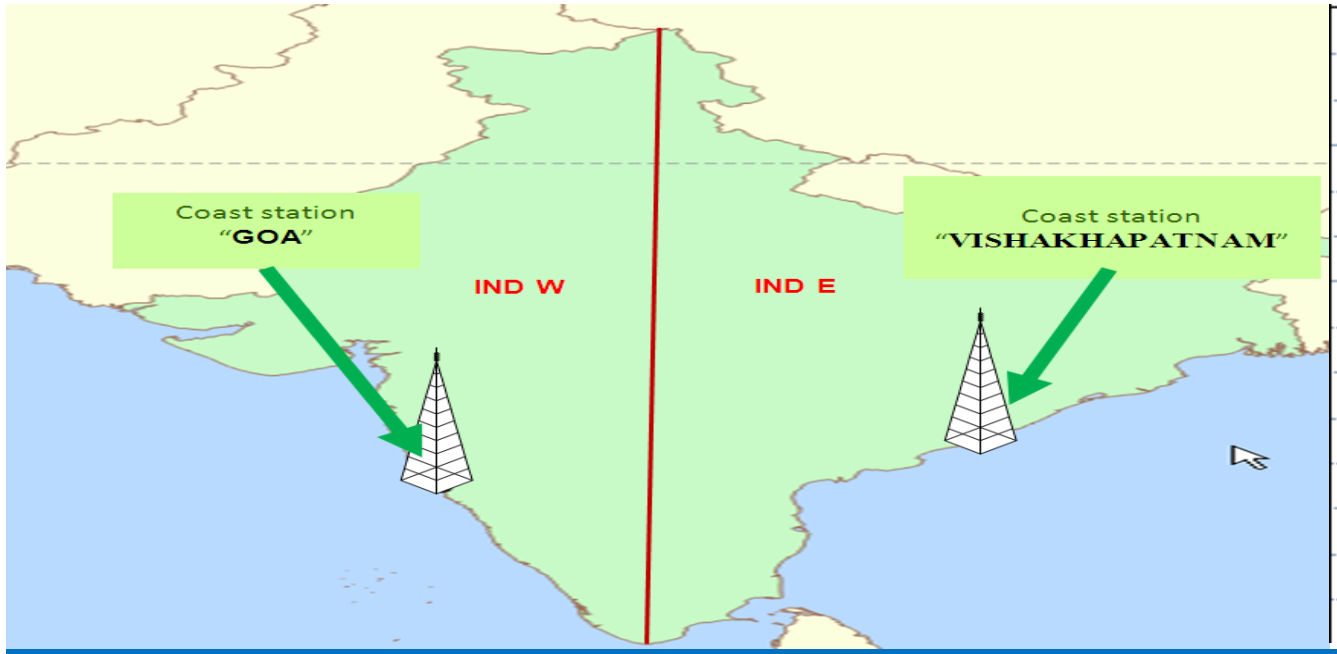
# Allotment plan for the maritime mobile service (AP25 to RR)



- **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)

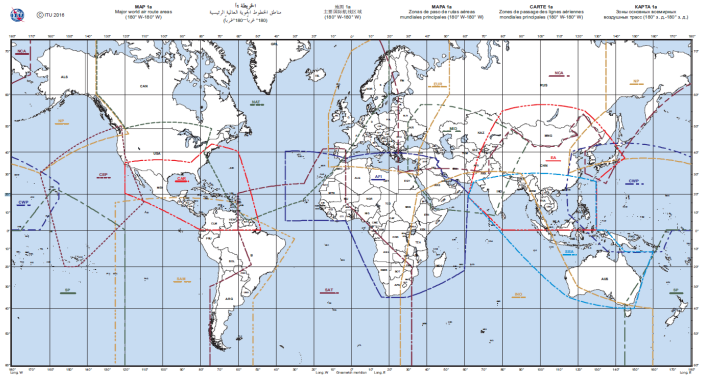




- Worldwide plan for aeronautical mobile route service

  **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 AP**27/60**, e.g. (e.g. J3E, H2B, J7B, J7D, J9B etc.): 6 kW (aeronautical stations)
    400 W (aircraft stations)



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# Frequency assignment plans for FXM services

## Regional frequency assignment plans



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



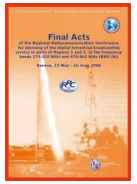
**GE85-R1-AER:** plan for aeronautical radionavigation service, MF bands



**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**





# 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<br>1 606.5 - 2 160 kHz | Region 1 |
| GE85-R1-MAR (Assignment) | Maritime Mobile | 415 - 495 kHz<br>505 - 526.5 kHz<br>1 606.5 - 1 625 kHz<br>1 635 - 1 800 kHz<br>2 045 - 2 160 kHz | Region 1 |
| GE85-R1-AER (Assignment) | Aeronautical Radionavigation | 415 - 435 kHz<br>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<br>470-862 MHz | In parts of Regions 1 and 3 |

# Mandatory coordination under other provisions

## - Worldwide frequency allotment plan of AP25

- **25/1.1 1** Before notifying to the Radiocommunication Bureau or bringing into use at any coast radiotelephone station a frequency assignment not covered by an allotment in the Frequency Allotment Plan contained in Section II of this Appendix, an administration which intends to establish a coast radiotelephone station and has no allotment in the Plan, or

- **25/1.1.2** intends to expand its coast radiotelephone service and requires an additional allotment,

shall send the information listed in Appendix **4** to the Bureau

# T15

<HEAD>

t_adm = RUS

t_char_set = ISO-8859-1

</HEAD>

<NOTICE>

t_notice_type = T15

t_fragment = AP25

t_action = ADD

t_adm_ref_id = FC-103-2011

t_chn_pref = 604

t_stn_cls = FC

t_bdwdth_cde = 2K80

t_emi_cls = J3E--

t_zone_id = RUS EO

t_op_hh_fr = 00:00

t_op_hh_to = 24:00

t_d_adm_ntc = 2011-04-27

t_d_inuse = 2011-10-25

t_nat_srv = CP

t_prov = AP25/1.1.2

t_traffic = 200

<ANTENNA>

t_ant_dir = ND

t_dist_max = 1500

t_gain_max = 2.7

t_gain_type = D

t_pwr_ant = 30

t_pwr_xyz = X

<RX_STATION>

t_geo_type = ZONE

t_zone_id = MAR01

</RX_STATION>

<RX_STATION>

t_geo_type = ZONE

t_zone_id = MAR03

</RX_STATION>

<RX_STATION>

t_geo_type = ZONE

t_zone_id = MAR05

</RX_STATION>

</ANTENNA>

<COAST_STATION>

t_lat = +594142

t_long = +1500935

t_site_name = RADUZHNIY MAG

</COAST_STATION>

<PEAK_HOURS>

t_peak_hh_fr = 00:00

t_peak_hh_to = 24:00

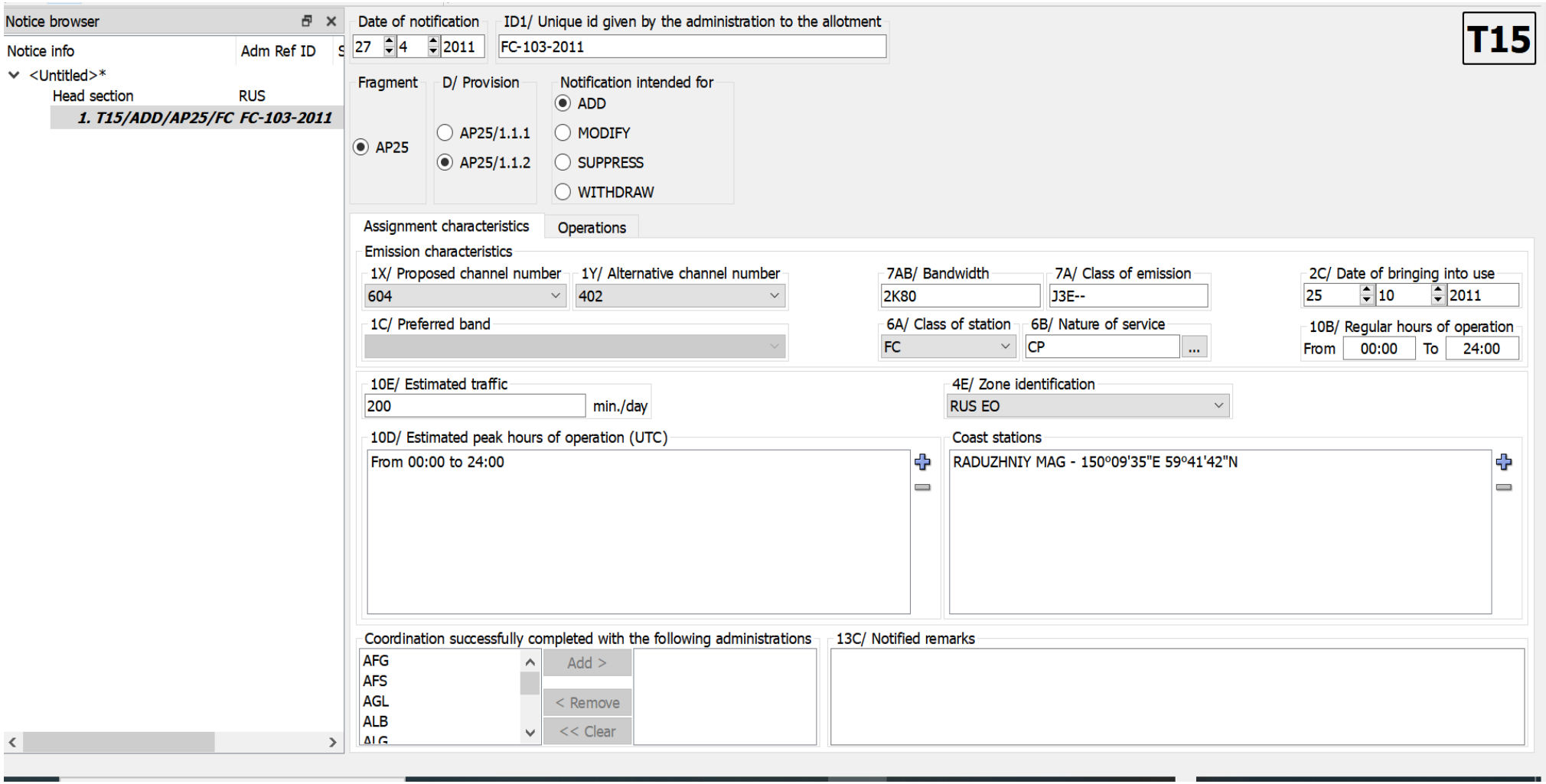
</PEAK_HOURS>

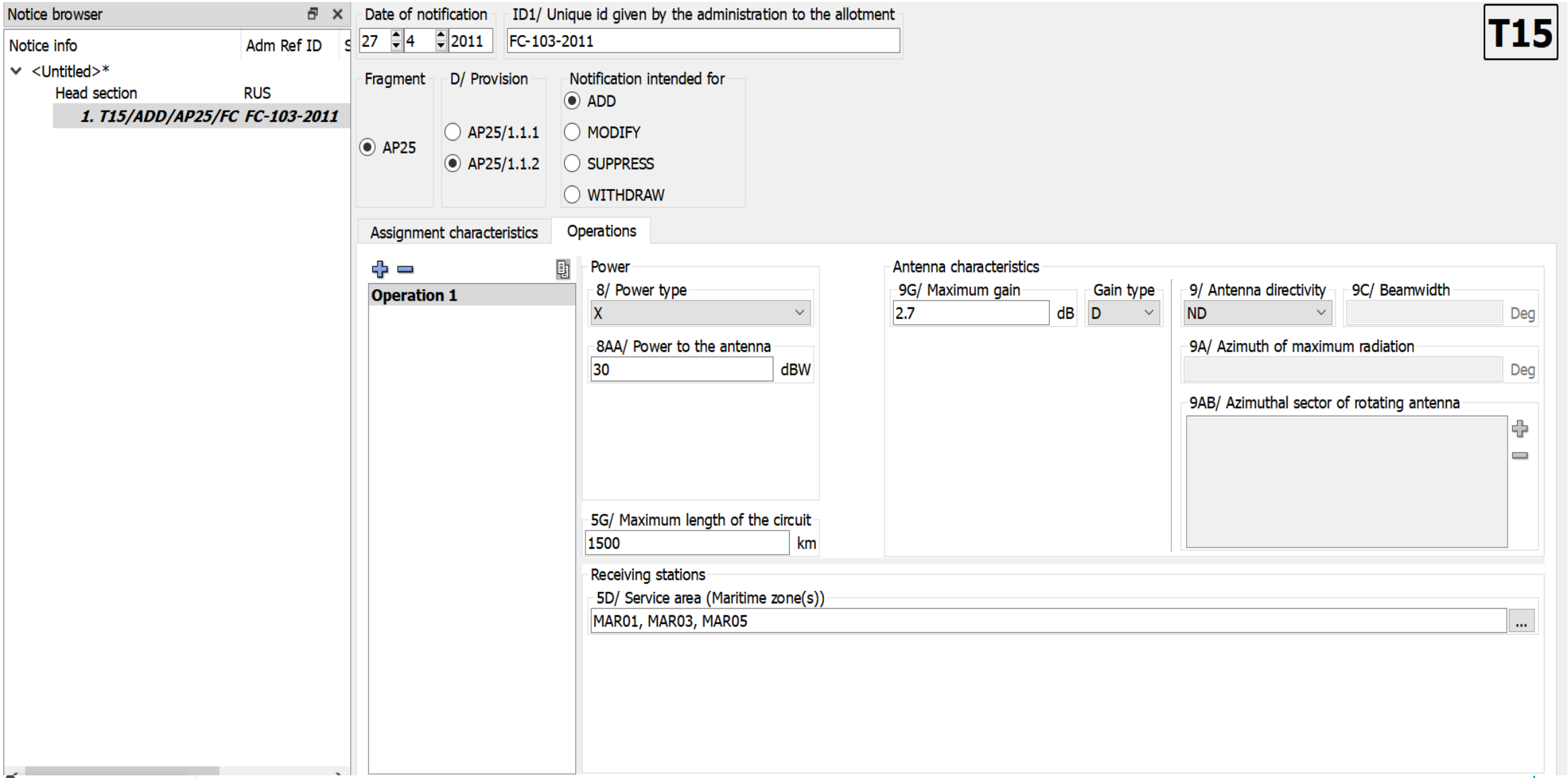
</NOTICE>

<TAIL>

t_num_notices = 1

</TAIL>


Notice browser
Notice info
Adm Ref ID
<Untitled>*
Head section
RUS
1. T15/ADD/AP25/FC FC-103-2011
Date of notification
27 4 2011
ID1/ Unique id given by the administration to the allotment
FC-103-2011
T15
Fragment
AP25
D/ Provision
AP25/1.1.1
AP25/1.1.2
Notification intended for
ADD
MODIFY
SUPPRESS
WITHDRAW
Assignment characteristics
Operations
Emission characteristics
1X/ Proposed channel number
604
1Y/ Alternative channel number
402
7AB/ Bandwidth
2K80
7A/ Class of emission
J3E--
2C/ Date of bringing into use
25 10 2011
1C/ Preferred band
6A/ Class of station
FC
6B/ Nature of service
CP
10B/ Regular hours of operation
From 00:00 To 24:00
10E/ Estimated traffic
200
min./day
4E/ Zone identification
RUS EO
10D/ Estimated peak hours of operation (UTC)
From 00:00 to 24:00
Coast stations
RADUZHNIY MAG - 150°09'35"E 59°41'42"N
Coordination successfully completed with the following administrations
AFG
AFS
AGL
ALB
Add >
< Remove
<< Clear
13C/ Notified remarks


Notice browser
Notice info
Adm Ref ID
<Untitled>*
Head section
RUS
1. T15/ADD/AP25/FC
FC-103-2011
Date of notification
27
4
2011
ID1/ Unique id given by the administration to the allotment
FC-103-2011
T15
Fragment
AP25
D/ Provision
AP25/1.1.1
AP25/1.1.2
Notification intended for
ADD
MODIFY
SUPPRESS
WITHDRAW
Assignment characteristics
Operations
Operation 1
Power
8/ Power type
X
8AA/ Power to the antenna
30
dBW
5G/ Maximum length of the circuit
1500
km
Antenna characteristics
9G/ Maximum gain
2.7
dB
Gain type
D
9/ Antenna directivity
ND
9C/ Beamwidth
Deg
9A/ Azimuth of maximum radiation
Deg
9AB/ Azimuthal sector of rotating antenna
Receiving stations
5D/ Service area (Maritime zone(s))
MAR01, MAR03, MAR05

***TerRaBench*** - PROD
User: bogens

## Examination for:

**Assignment ID:** 111047221
**Administration:** RUS
**Administration's unique ID:** FC-103-2011
**Fragment:** AP25
**Provision:** AP25/1.1.2
**Notice type:** T15 / ADD
**Date Rcv:** 28 avr. 2011
**Date In Use:** 25 oct. 2011
**Stage:** INIT PUB
**Last processed by:** [REVQ]\BOGENS **on** 24 mai 2011 - 14:49:59

**Preferred Channel:** 601
**Class of station:** FC

## Examination results:

### Plan examination

- **Status:** REVIEW
- **Executed on:** 25-05-2011 14:38:51 **Duration:** 1min 46s
- **Information:**
  1. Number of resulting requirements: 1 - Number of successfully analyzed requirements: 1
  2. Preferred Channel: 601 - No Affected Allotments - Affecting Allotments: ALS ; CAN W ; CHN ; GUM ; HWA ; INS ; KAZ
  3. Least Loaded Channel (111047221.001): 607 - No Affected Allotments - Affecting Allotments: CHN
  4. Reference Threshold Values: (IPTot)max = 1.140 ; (QCTot)max = 1.200 ; (CF)max = 2.340 ; (IP)max = 0.220

## Affected/Affecting allotments:

| Channel No | Affected allotments | Affecting allotments |
|---|---|---|
| 601 | | ALS, CAN W, CHN, GUM, HWA, INS, KAZ |
| 602 | | ALS, CAN W, GUM, HWA, INS, KAZ |
| 603 | | ALS, CAN NO, CAN W, GUM, HWA, INS |
| 604 | | ALS, CAN W, CHN, GUM, HWA, INS |
| 605 | | ALS, CAN W, GUM, HWA, INS |
| 607 | | CHN |
| 608 | | ALS, CHN, GUM, HWA |

## Requirement 111047221.001: Allotment's channels

| Channel No | IP | QC | CF | Channel items | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Requirement ID | Adm | Allot. Name | Received IP | Caused IP | Is affected | Is affecting | Stage |
| 601 | 0.7906 | 1.1173 | 1.9079 | 088100574.000 | USA | ALS | 0.163 | 0.371 | FALSE | TRUE | R |
| | | | | 088100581.000 | CAN | CAN W | 0.157 | 0.236 | FALSE | TRUE | R |
| | | | | 088100584.000 | CHN | CHN | 0.148 | 0.278 | FALSE | TRUE | R |
| | | | | 088100591.000 | USA | GUM | 0.156 | 0.223 | FALSE | TRUE | R |
| | | | | 088100592.000 | USA | HWA | 0.156 | 0.234 | FALSE | TRUE | R |
| | | | | 088100594.000 | INS | INS | 0.125 | 0.236 | FALSE | TRUE | R |
| | | | | 092102076.000 | KAZ | KAZ | 0.138 | 0.235 | FALSE | TRUE | R |

| | | |
|---|---|---|
| 6 502.4 (6 501) (601) | ALG | |
| | ALS | |
| | ARG CL | |
| | ARG SO | |
| | ARS | |
| | AZE | |
| | CAN NO | ADD |
| | CAN W | |
| | CHL CL | |
| | CHL NO | |
| | CHN | |
| | COG | |
| | CZE | |
| | D1 | |
| | EST | |
| | GEO | |
| | GRC | |
| | GUM | |
| | HNG | |
| | HRV | |
| | HWA | |
| | I | ADD |
| | INS | |
| | IRN | |
| | IRQ | |
| | ISL | |
| | J | |
| | KAZ | |
| | LBY | |
| | LTU | |
| | LVA | |
| | MLA | ADD |
| | MLD | ADD |
| | MNE | |
| | NCL | |
| | NZL | |
| | PTR | |
| | ROU | |
| | RUS AS | |
| | RUS SW | |
| | RUS W | |
| | SVK | |
| | TKM | |
| | UKR | |
| | USA CL | |
| | USA E | |
| | USA SO | |
| | USA W | |

INTERNATIONAL TELECOMMUNICATION UNION
RADIOCOMMUNICATION BUREAU

| BR IFIC / DATE 2696/14.06.2011 | SPECIAL SECTION No. AP25/143 |
|---|---|

**Procedure for bringing up to date the Frequency Allotment Plan for Coast Radiotelephone Stations operating in the Exclusive Maritime Mobile Bands between 4000 and 27500 kHz of Appendix 25 to the Radio Regulations (AP 25)**

For the explanation of symbols and abbreviations, reference should be made to the Radio Regulations (RR) and to the Preface to the "BR International Frequency Information Circular" (BR IFIC)

This Special Section consists of the Parts indicated below by an x in the relevant box

[X] *Part A* - Characteristics of the proposed allotments

[ ] *Part B* - Characteristics of the allotments entered in the Plan (as a result of the application of the procedure of Section I of AP **25**)

[ ] *Part C* - Allotments deleted from the Plan

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| Prov. AP 25/ | 1x | 1y | 1z | 2e | 4e | 5d | 5g | 6b | 7a | 8a | 9 | 9a | 9c | 9g | 10b | 10d | 10e | 13ca |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.1.2 | 601 | - | - | 25.10.2011 | RUS EO | 01 03 05 | 1500 | CP | J3E-- | 30.0 | ND | - | - | 2.7 | 0000-2400 | 0000-2400 | 200 | - |

| 13cb |
|---|
| B1 / * |
| B2 / ALS CAN W CHN GUM HWA INS KAZ |

| EXPIRY DATE FOR THE RECEIPT OF COMMENTS: | 14.08.2011 |
|---|---|

13ca * Nil

13cb Comments and recommendations of the Bureau

B1/B2/ The Bureau, applying the technical criteria and calculation method of IFRB Circular-letter 843 of 31 October 1990, examined the proposed allotment against the allotments of other administrations on the same channel. For this purpose, the Bureau used the characteristics of the existing allotments already recorded in the AP25 Plan and the characteristics of proposed allotments published in a Special Section in accordance with No. 25/1.2, for which the procedure of AP 25/Section I is currently in progress. The results of this examination show that there are apparent incompatibilities between the proposed allotment and allotments appearing in AP 25 (existing allotments) or published in accordance with No. 25/1.2 (proposed allotments) on the channel in question for the following allotment areas (designated by the symbols following the oblique stroke):

B1/ The proposed allotment could cause harmful interference to the existing or projected allotments of the following allotment areas:

B2/ The proposed allotment could suffer harmful interference from the existing or projected allotments of the following allotment areas:

INTERNATIONAL TELECOMMUNICATION UNION
RADIOCOMMUNICATION BUREAU

| BR IFIC / DATE 2742/16.04.2013 | SPECIAL SECTION No. AP25/151 |
|---|---|

**Procedure for bringing up to date the Frequency Allotment Plan for Coast Radiotelephone Stations operating in the Exclusive Maritime Mobile Bands between 4000 and 27500 kHz of Appendix 25 to the Radio Regulations (AP25).**

For the explanation of symbols and abbreviations, reference should be made to the Radio Regulations (RR) and to the Preface to the "BR International Frequency Information Circular" (BR IFIC).

This Special Section consists of the Parts indicated below by an x in the relevant box

☐ *Part A* - Characteristics of the proposed allotments

☒ *Part B* - Characteristics of the allotments entered in the Plan (as a result of the application of the procedure of Section I of AP25)

☐ *Part C* - Allotments deleted from the Plan

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**Partie B (suite) / Part B (continued) / Parte B (continuación)**

| Prov. AP 25/ | 1x | 1y | 1z | 2c | 4e | 5d | 5g | 6b | 7a | 8a | 9 | 9a | 9c | 9g | 10b | 10d | 10e | 13ca |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.21 | 604 | - | - | 25.10.2011 | RUS EO | 01 03 05 | 1500 | CP | J3E– | 30.0 | ND | - | - | 2.7 | 0000-2400 | 0000-2400 | 200 | - |

| 1x | 13ca | 13cb | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 604 | * | C1 / | AP25 / | 143 / | 2696 / | 14.06.2011 | | | | | | | | | | | |
| | | C2 / | ALG | ARG CL | ARG SO | ARS | AZE | CAN W | CHL CL | CHL NO | CHN | CZE | D1 | EST | GRC | HNG | |
| | | | I | INS | ISL | J | LTU | LVA | MNE | NZL | ROU | SVK | UKR | | | | |
| | | C3 / | IRN | | | | | | | | | | | | | | |
| | | C4 / | COG | GEO | HRV | IRQ | KAZ | LBY | MLA | MLD | F (NCL) | TKM | | | | | |
| | | C5 / | 601 | | | | | | | | | | | | | | |

**13cb** Explanation of symbols

C1/ The particulars of the allotment were published in accordance with AP**25**/1.2 in Part A of Special Section, the reference of which is given by the figures following the symbol, AP25 / Special Section / BR IFIC / date of the BR IFIC.

C2/ The Administrations responsible for the allotment of the allotment areas represented by the symbols following the slant stroke have communicated their agreement, in accordance with AP**25**/1.8.

C3/ As a result of the examination required under AP**25**/1.20, the Bureau reached a favourable finding with respect to the assignments of the allotment areas represented by the symbols following the slant stroke.

C4/ The Administrations responsible for the allotment of the allotment areas represented by the symbols following the slant stroke have failed to give their decision concerning this allotment. Each of these Administrations has been informed that the provisions of AP**25**/1.16.1 and AP**25**/1.16.2 will be applied to the assignment covered by this allotment.

C5/ As a result of the examination required under AP**25**/1.20, the Bureau reached an unfavourable finding, it determined the channel which is the least affected one and the administration concerned requested the Bureau to enter the proposed allotment in this channel, replacing the channel number following the slant stroke published in the Special Section indicated under C1/.

* Nil

# 2. 4 Mandatory coordination under other provisions (9)

## - Worldwide aeronautical frequency allotment plans of AP26 and AP27

| Administrative Data | | Emission Characteristics | |
|---|---|---|---|
| Source notice type | T12 | Assigned frequency | 15.0744 MHz |
| Date of notice | 06/04/2016 | Reference (carrier) frequency | 15.073 MHz |
| Date notice received | 06/04/2016 | Class of emission | J3E-- |
| | | Nature of service | CO |
| Notifying Administration | LTU | | |
| Identifier assigned by the BR | 116083813 | Bandwidth | 2.8 kHz |
| Unique identifier given by the Administration | | Bandwidth code | 2K80 |
| Amendment type | RECORDED | Frequency deviation | |
| Modification type | NOT MODIFY | Energy dispersal | |
| Date of entry into the MIFR | 06/04/2016 | | |
| Fragment | NTFD_RR | Channel number | |
| | | Preferred band | |
| Provision | RR11.2 | Preferred channel | |
| Operating agency | | Alternative channel | |
| Address code | A | Traffic | |
| Date of bringing into use | 15/05/2016 | | |
| Regular hours of operation | From To<br>00:00 24:00 | | |
| Examination category | P26 | | |

## - No allotment of the frequency 15.073 MHz to LTU in AP26 Plan

| | | |
|---|---|---|
| 15 073 | REGY | ATA(ARG) |
| | REG1 | BHR(USA) COG D DJI(F) E F GEO GRC(USA) ISL MDG MNG RUS SEN TUN UKR |
| | REG2 | ALS ARG BER(USA) CAN HWA JON MDW PNR PTR USA |
| | REG3 | AUS CHN GUM IND J MHL(USA) NCL OCE WAK |

# 2. 4 Mandatory coordination under other provisions (9)

## - Worldwide aeronautical frequency allotment plans of AP26 and AP27

### ➢ AP26: protection of technical criteria (provision AP26/6.1)

| Frequency band (kHz) | Repetition half-distance (km) | | | |
|---|---|---|---|---|
| | Northern hemisphere | | Southern hemisphere | |
| | North-South | East-West | North-South | East-West |
| 3 025- 3 155 | 550 | 600 | 550 | 600 |
| 3 900- 3 950 | 650 | 650 | 650 | 650 |
| 4 700- 4 750 | 725 | 775 | 725 | 775 |
| 5 680- 5 730 | 1 175 | 1 325 | 1 150 | 1 300 |
| 6 685- 6 765 | 1 350 | 1 600 | 1 225 | 1 425 |
| 8 965- 9 040 | 2 525 | 3 525 | 2 225 | 3 075 |
| 11 175-11 275 | 3 375 | 5 575 | 2 675 | 3 925 |
| 13 200-13 260 | 4 550 | 6 650 | 3 475 | 5 625 |
| 15 010-15 100 | 5 050 | 7 450 | 4 800 | 7 100 |
| 17 970-18 030 | 5 750 | 8 250 | 5 675 | 7 475 |

### ➢ Examination result:

| Finding type | nding stat | Finding | Date of update | Source |
|---|---|---|---|---|
| CONFORM PLAN | FINAL | UNFAVORABLE | 12/05/2016 | [TerRaPub]\rosap |
| REX | FINAL | FAVORABLE | 12/05/2016 | [TerRaPub]\rosap |
| TEX | FINAL | UNFAVORABLE | 12/05/2016 | [TerRaPub]\rosap |

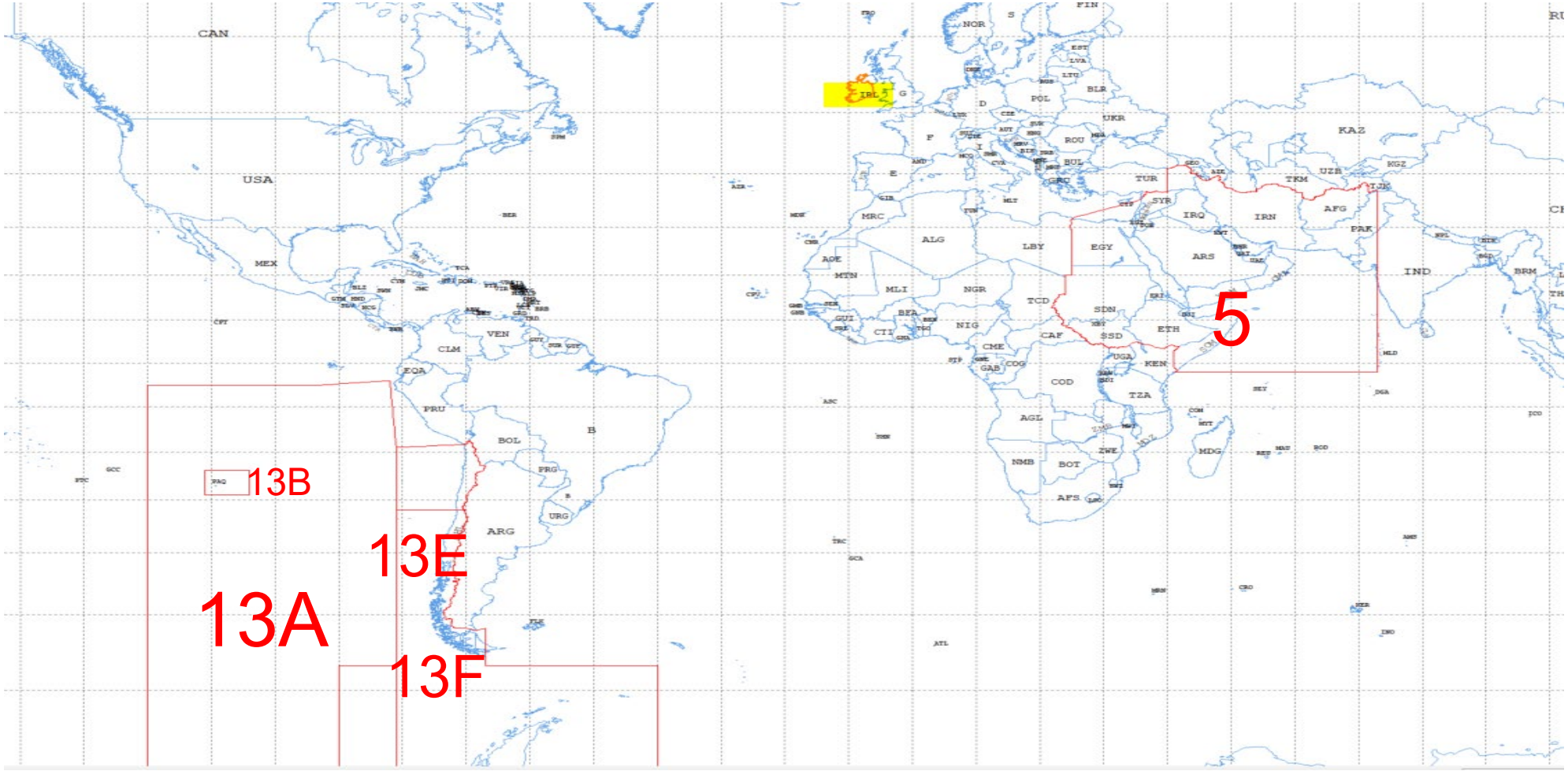
Finding observation H
Finding reference X/AP26
Finding action

## ➢ AP27:

The

| | | | |
|---|---|---|---|
| Source notice type | T12 | Assigned frequency | 17.9684 MHz |
| Date of notice | 26/08/2002 | Reference (carrier) frequency | 17.967 MHz |
| Date notice received | 13/09/2002 | Class of emission | J2DEN |
| | | Nature of service | CO |
| Notifying Administration | IRL | | |
| Identifier assigned by the BR | 102075741 | Bandwidth | 2.8 kHz |
| Unique identifier given by the Administration | 8895 | Bandwidth code | 2K80 |
| Amendment type | RECORDED | Frequency deviation | |
| Modification type | | Energy dispersal | |
| Date of entry into the MIFR | 13/09/2002 | | |
| Fragment | NTFD_RR | Channel number | |
| | | Preferred band | |
| Provision | RR11.2 | Preferred channel | |
| Operating agency | | Alternative channel | |
| Address code | A | Traffic | |
| Date of bringing into use | 30/07/2002 | | |
| Regular hours of operation | From To<br>00:00 24:00 | | |
| Examination category | P27 | | |

| | | |
|---|---|---|
| 17 967 | R 5 13A 13B 13E 13F | CC 13A 13B 13E 13F |

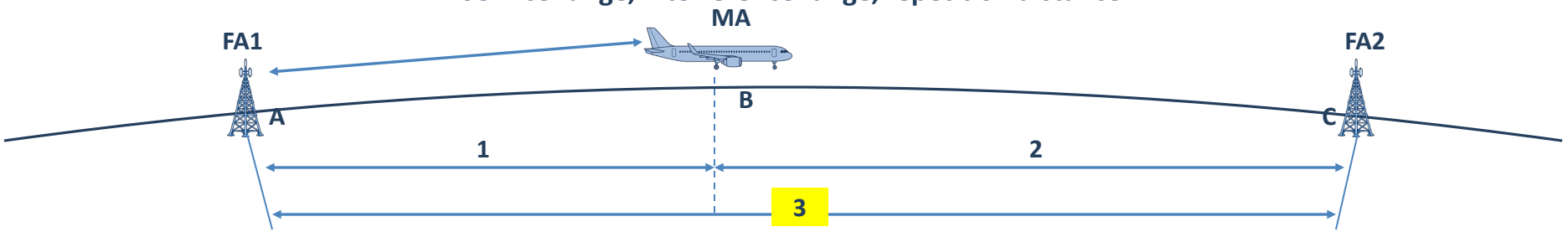

13B
13E
13A
13F
5

## AP27:

- 15 dB protection ratio, between the wanted signal at an aircraft station at the limit of **the service range** and the signal from a potentially **interfering aeronautical station** operating on **the same frequency**.
- **The repetition distance is determined by this value.**

**FIGURE 1**

**Service range, interference range, repetition distance**




FA1 : aeronautical station in communication with aircraft station MA

FA2 : aeronautical station in communication with aircraft stations other than MA

MA : aircraft station in communication with aeronautical station FA1

1 : service range AB

2 : interference range CB

3 : repetition distance AC

AP27-01

## AP27

- for the **13 MHz** band, the **repetition factor** at least 3
- for the **18 and 22 MHz** bands, the **repetition factor** is 4. The longitudinal separation might be decreased to allow for a repetition of 4 (at **13 MHz)** and 6 (at **18 and 22 MHz**).
- for the **bands 3 to 11.3 MHz**: **method of use of the transparencies** to determine the **coordination contour**. A transmitter located at any point inside the contour will result in a protection ratio of less than 15 dB.

**4.1 Frequency bands between 3 and 11.3 MHz**

**27**/35 4.1.1 The transparencies are constructed on the basis of the following sharing conditions:

| Areas | Bands between (MHz) | Sharing conditions |
|---|---|---|
| MWARA or VOLMET area to MWARA or VOLMET area | 3 and 6.6<br>9 and 11.3 | Night propagation<br>Day propagation<br>NOTE – 6.6 MHz and 5.6 MHz sharing conditions are considered to be the same. |
| MWARA or VOLMET area to RDARA | 3 and 5.6<br>6.6 and 11.3 | Night propagation<br>Day propagation |
| RDARA to RDARA | 3 and 4.7<br>5.6 and 11.3 | Night propagation<br>Day propagation |

## AP27:

| Finding type | nding stat | Finding | Date of update | Source |
|---|---|---|---|---|
| CONFORM PLAN | FINAL | UNFAVORABLE | 05/12/2003 | [TerRaPub]\eichenba |
| REX | FINAL | FAVORABLE | 05/12/2003 | [TerRaPub]\eichenba |
| TEX | FINAL | UNFAVORABLE | 05/12/2003 | [TerRaPub]\eichenba |

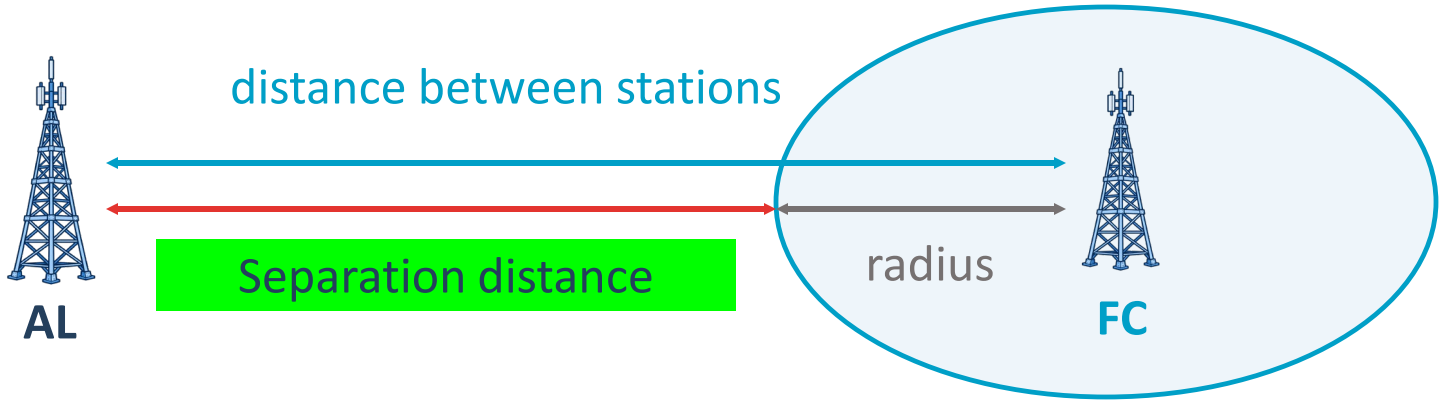
| | |
|---|---|
| Finding observation | H |
| Finding reference | X/AP27 |
| Finding action | |

# Regional frequency assignment plan of GE85M (Notice form type T16)

- **GE85-R1-MAR:** plan for the **maritime mobile service** in the MF bands in Region 1
  - ✓ Region 1 plan in bands: 415 – 495 kHz, 505 - 526.5 kHz, 1606.5-1625 kHz, 1635-1800 kHz, 2045-2160 kHz
  - ✓ **Takes into account ARNS, FS, LMS and RDS**
- **GE85-R1-AER:** plan for the **aeronautical radionavigation service** in the MF bands in Region 1
  - ✓ Region 1 plan in bands: 415 – 435 kHz, 510 – 526.5 kHz
  - ✓ **Takes into account also maritime mobile service stations**

# Calculation of the separation distance between the station and service areas of the assignments to be protected

- **Separation distance** is determined by deducting the radius of the service area of the protected station from the calculated distance. Attention: for FC service area is limited to the sea




Separation Distance = distance between stations - radius

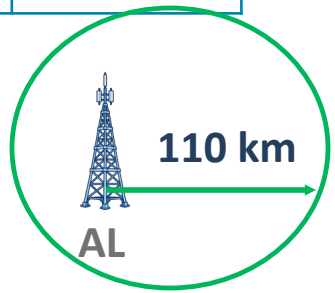
# Example of determination of the coordination distance

## (AL station, 430 kHz, at 19E41/ 46N41, 2K14, A2A, Radius = 111 km, BR ID 109058531)

| Δf, kHz | For protection of ARNS stations | | | | For protection of MMS stations | | | |
|---|---|---|---|---|---|---|---|---|
| | $E_{min}$ dB(μV/m) | PR dB | ΔP dB | $E_{lim}$ dB(μV/m) | $E_{min}$ dB(μV/m) | PR dB | ΔP dB | $E_{lim}$ dB(μV/m) |
| **0** | 37 | 15 | 29 | 51 | 31.5 | 8 | 29 | 52.5 |
| **0.5** | 37 | 15 | 29 | 51 | 31.5 | 2 | 29 | 58.5 |
| **1** | 37 | 9 | 29 | 57 | 31.5 | -38 | 29 | 98.5 |
| **1.5** | 37 | 2 | 29 | 64 | 31.5 | -44 | 29 | 104.5 |
| **2** | 37 | -5 | 29 | 71 | 31.5 | -68 | 29 | 128.5 |
| **2.5** | 37 | -12.5 | 29 | 78.5 | | | | |
| **3** | **37** | **-20** | **29** | **86** | | | | |

limiting interfering field strength

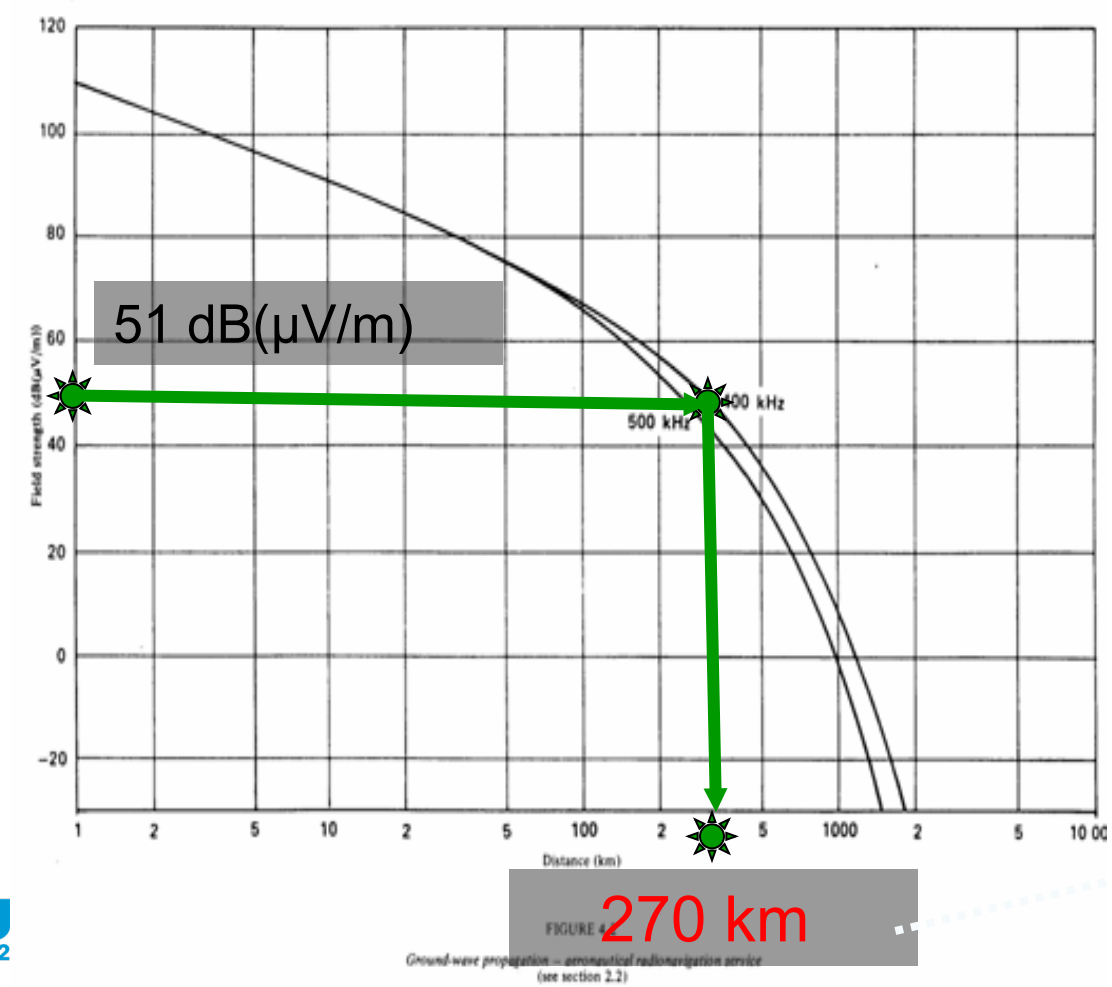
**Emin** - minimum field strength to be protected, (Annex 4)
**PR** – protection ratio, dB (Annex 4)
**ΔP** = Pref (30dBW)– Pused, power correction factor




**Elim = Emin – PR + ΔP**

# Calculation of the coordination distance

- Using the propagation curve, the values of limiting interfering field strength are converted into the coordination distances




| Δf, kHz | For protection of ARNS stations | | | | For protection of MMS stations | | | |
|---|---|---|---|---|---|---|---|---|
| | $E_{min}$ dB(μV/m) | PR dB | ΔP dB | $E_{lim}$ dB(μV/m) | $E_{min}$ dB(μV/m) | PR dB | ΔP dB | **$E_{lim}$ dB(μV/m)** |
| **0** | 37 | 15 | 29 | 51 | 31.5 | 8 | 29 | **52.5** |
| **0.5** | 37 | 15 | 29 | 51 | 31.5 | 2 | 29 | **58.5** |
| **1** | 37 | 9 | 29 | 57 | 31.5 | -38 | 29 | **98.5** |
| **1.5** | 37 | 2 | 29 | 64 | 31.5 | -44 | 29 | **104.5** |
| **2** | 37 | -5 | 29 | 71 | 31.5 | -68 | 29 | **128.5** |
| **2.5** | 37 | -12.5 | 29 | 78.5 | | | | |
| **3** | **37** | **-20** | **29** | **86** | | | | |

| Δf, kHz | For protection of ARNS | | For protection of MMS | |
|---|---|---|---|---|
| | $E_{lim}$ dB(μV/m) | Coordination Distance, km | $E_{lim}$ dB(μV/m) | **Coordination Distance, km** |
| **0** | 51 | **270** | 52.5 | **260** |
| **0.5** | 51 | **270** | 58.5 | **190** |
| **1** | 57 | **205** | 98.5 | **4.5** |
| **1.5** | 64 | **122** | 104.5 | **2** |

## Comparison of separation distance with coordination distance and identification of affected stations

- For each protected assignment in the Plan (**recorded in the MIFR),** the **separation distance** is compared with the **coordination distance** of every assignment.
- If the separation distance is less than the coordination distance, the assignment **is considered as affected**
- Otherwise, assignment is considered as not affected

# Mandatory coordination under other provisions

## - Regional frequency assignment plan of GE85N (Notice form type T12)

- GE85-EMA: plan for the Maritime Radionavigation Service (Radiobeacons) in the MF bands in European Maritime Area
- in band: 283.5 - 315 kHz
- takes into account ARNS
- the maximum service area radius is 280 km.

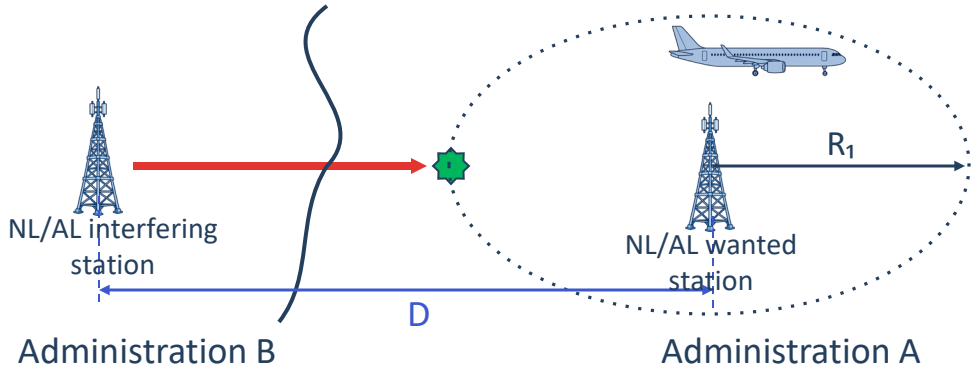
# Identification of potentially affected administrations

- The criteria is defined by signal-to-interference ratio (S/I).

- The method of identification of potentially affected administrations consists in four steps.
  - To calculate the interfering field strength produced by a new station **at test points**.
  - To calculate the wanted field strength from a “victim” station at the same test points.
  - To calculate the signal-to-interference ratio (S/I) for each test point, i.e., the difference between wanted signal field strength and interfering field strength.

    (S/I, see RoP Part B4)
  - The worst-case (minimum S/I) value is retained and compared with the protection ratio.

* ground-wave propagation conditions



# The computer program package for the establishment of the Plan applies.

On the basis of the calculations at **the test points** above, the list of potentially affected administrations is established.

**GE85-EMA Conformity to Plan Exam Results (Production Database, 28-Nov-2024 17:03:09)**

**Assignment ID 102059822**

Adm: G
Assigned Freq: 285.5 kHz
Site Name: STIRLING
Class: NL
Date Received: 16-Apr-2002
Coordinates: 004°04'00"W 56°04'00"N
Nature of Service: RC
Bandwidth: 500H
Class of Emission: G1D--
Recorded Assignment
Operation 1: Antenna Power:
Operation 1: Radiated Power: 6 dBW
Operation 1: Radius: 280 km

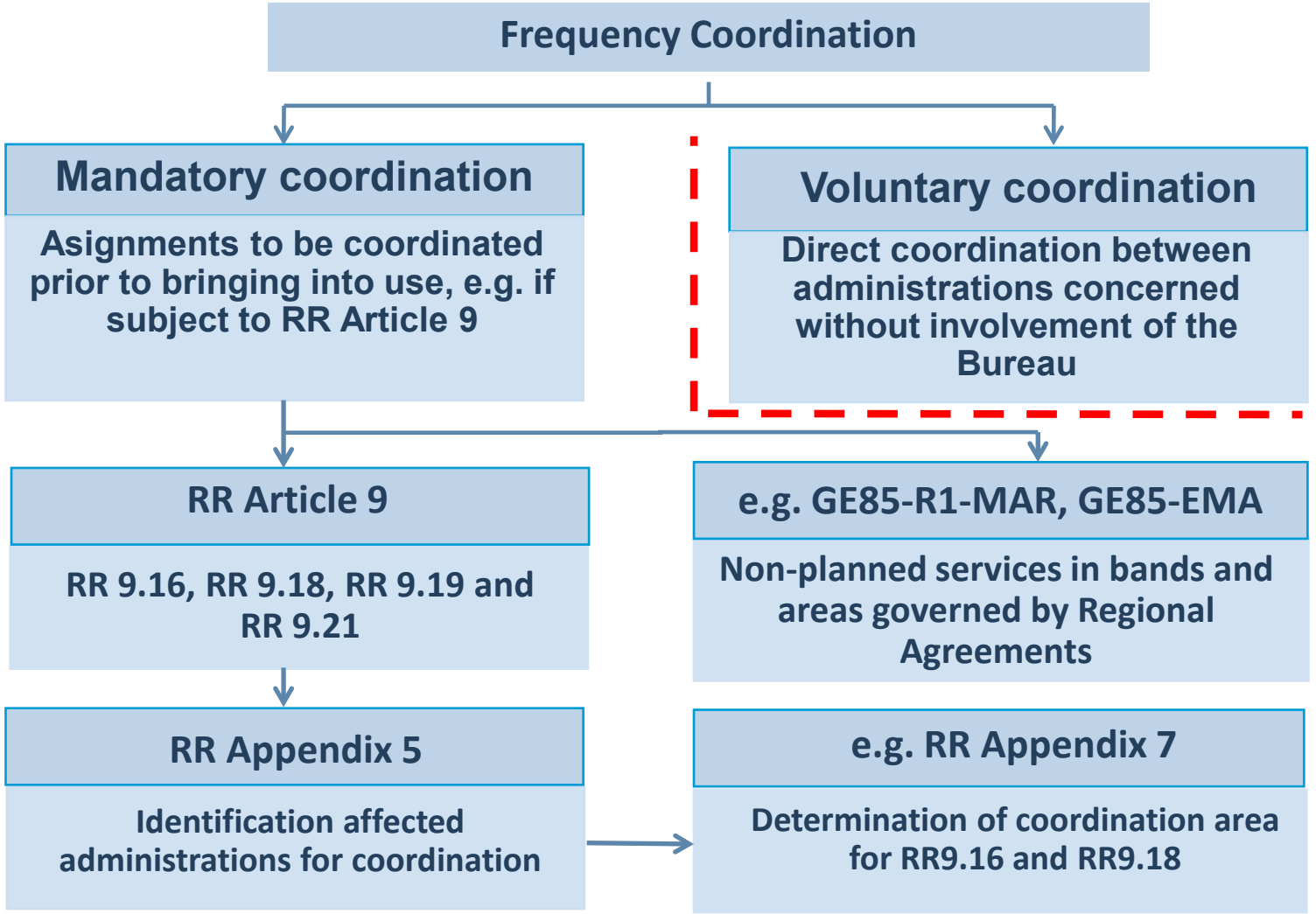
**Coordination Summary:**

All required coordinations (if any) have been completed.

**Maritime Recorded Assignments (within 1000 km) which were considered:**

| Exam Summary | Site-to-Site Distance (km) | Required Protection Ratio (dB) | Assignment ID | Fragment | Intent | Adm | Assigned Freq (kHz) | Site Name | Class | Bandwidth | Received | Coordinates | Radius (km) | Rad Power (dBW) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Too far away | 637 | -60.0 | 092005856 | GE85N | RECORDED | IRL | 284 | MIZEN HEAD LSTN | NL | 500H | 22-Jun-2001 | 009°49'00"W 51°27'00"N | 277 | |
| Too far away | 706 | -39.0 | 085070488 | GE85N | RECORDED | BEL | 285 | NIEUWPOORT PHARE | NL | 100H | | 002°43'E 51°09'N | 10 | |
| Too far away | 686 | -39.0 | 085070409 | GE85N | RECORDED | NOR | 285 | SLAATTEROEY | NL | 100H | | 005°04'E 59°54'N | 20 | |

# Coordination of FXM assignments

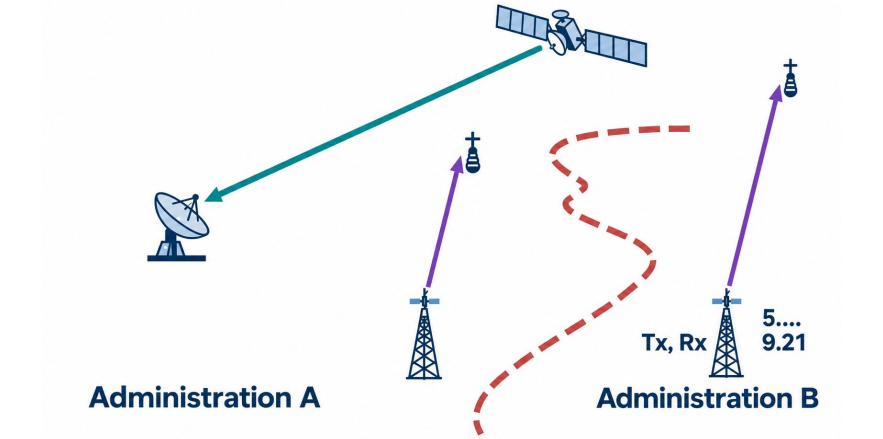


# Coordination of FXM assignments

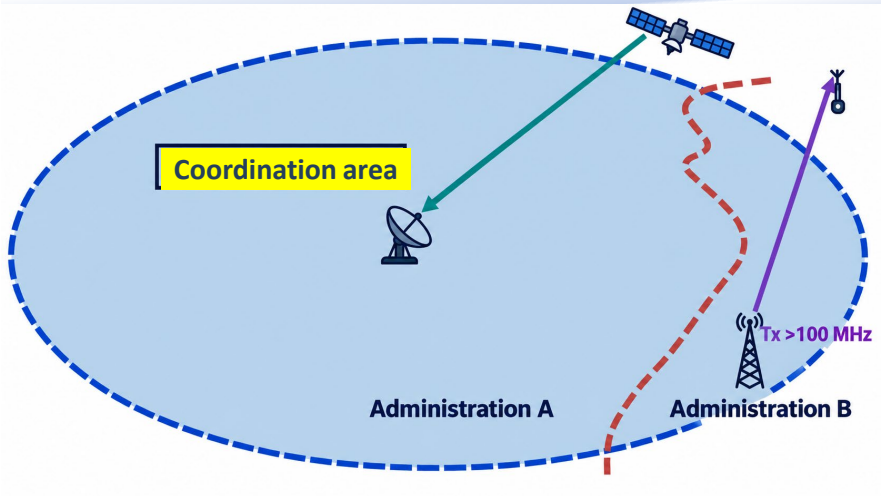
**Mandatory coordination cases under RR Article 9**

**RR 9.16, RR 9.18, RR 9.19 and RR 9.21**

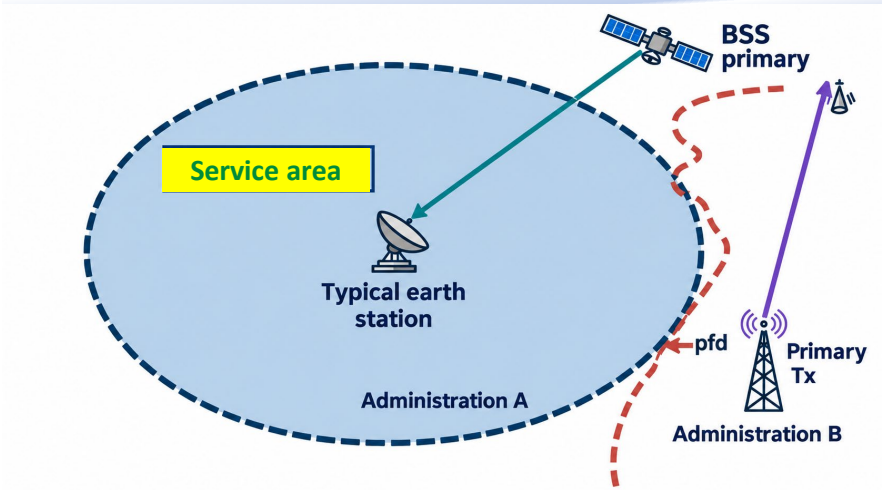
**RR 9.21**




**RR 9.16/RR 9.18**




**RR 9.19**



# 2. General aspects of coordination

## Goals of frequency coordination

- ✓ To ensure interference-free operation in border areas
- ✓ To assist in long-term planning of frequencies
- ✓ To promote efficient spectrum utilization
- ✓ To help to resolve interference between neighboring countries

## Parameters for coordination are defined in Nos. 1.166 - 1.176 of the Radio Regulations (RR), e.g.

- ✓ Interference
  - Permissible interference, Accepted interference, Harmful interference
- ✓ Coordination
  - Coordination distance, Coordination contour, Coordination area

# General aspects of coordination

## ➢ Methods to facilitate frequency sharing

| Freq. separation | Spatial separation | Time separation | Signal separation* |
|---|---|---|---|
| Channelling plans<br>Band segmentation<br>Frequency division multiple access (FDMA)<br>Control of emission characteristics | Geographical site separation<br>Space diversity<br>Antenna characteristics:<br>- polarization/ pattern discrimination<br>Physical barriers and site shielding | Time division multiple access (TDMA)<br>Duty cycle control<br>Dynamic real-time frequency assignment<br>Etc. | Coded modulation: e.g. CDMA system<br>Interference power/bandwidth adjustments<br>- Power control<br>- Low power, SRD<br>Adaptive signal processing: e.g. SDR |

*These techniques may also be applied together with the technologies of former separations. See Rec. ITU-R SM.1132

# General aspects of coordination

- Initiation
  - ✓ On planning stage
    - based on calculated values
  - ✓ On operating stage
    - based on measured values
- Steps of coordination
  - ✓ Identification of potentially affected countries
    - using agreed characteristics and the worst-case assumption
  - ✓ Coordination
    - using real parameters, environmental data including terrain elevation data and agreed methods

# General aspects of coordination

- Coordination criteria (coordination trigger) is given in a form of
  - ✓ interference-to-noise ratio (I/N) (e.g. I/N = 6 dB for mobile service)
  - ✓ Permissible field strength (E) (e.g. E = 25 dBµV/m in GE06)
  - ✓ Permissible power-flux density (pfd) (e.g. pfd = -154.5 dB(W/(m2.4 kHz)) in No. **5.431B**)
  - ✓ Distance separation (e.g. d=175 km in Res. **749 (Rev.WRC-19)** and **760 (Rev.WRC-19);** 1200 km in RoP on No. **9.19**)
  - ✓ Coordination contour/area (e.g. earth station coordination contour, Non-planned BSS service area)
- The conversion among the form of the criteria (E, I and pfd) is possible referring to Recommendation ITU-R P.525
- Coordination point
  - ✓ At the border (e.g. with respect Non-planned BSS area)
  - ✓ At a station (e.g. FSS earth station in Appendix **7**)

# 3. Mandatory Coordination of FXM assignments

## Article 9: Frequency assignments to be taken into account in effecting coordination are defined using Appendix 5 (No. **9.27**)

## 3.1 Coordination under Nos. 9.16 & 9.18 (1)

| Reference of Article 9 | Frequency bands (and Region) of the service for which coordination is sought | Threshold/condition | Remarks |
|---|---|---|---|
| No. **9.16** Terrestrial | Frequency bands for which a footnote refers to No. **9.11A** | Transmitting terrestrial station is situated within the coordination area of a receiving earth station of Non-GSO | The coordination area of the affected earth station has already been determined using the calculation method of Appendix **7** |
| No. **9.18** Terrestrial | Any frequency band allocated to a space service | Transmitting terrestrial station is situated within the coordination area of a receiving earth station of GSO | The coordination area of the affected earth station has already been determined using the calculation method of Appendix **7** |

# Coordination under Nos. 9.16 & 9.18 (2)

## ➢Example (1)

**BR ID:** 120107812
**Administration:** E
**Administration's unique ID:** VIZZ-0100009 fr 2020
**Fragment:** NTFD_RR
**Provision:** RR11.2
**Notice type:** T11 / ADD
**Date Rcv:** 07 Apr 2020
**Date In Use:** 17 Dec 2019
**Stage:** RETURNED
**Publication history:** NTFD_RR/1/2919, NTFD_RR/3/2932
**Last processed by:** [PUB]\landeryo **on** 21 Oct 2020 - 15:47:09

**Assigned frequency:** 11.605 GHz
**Bandwidth:** 40M0
**Examination category:** SBB
**Class of station:** FX
**Geographic area:** E
**Site name:** JAIZKIBEL
**Coordinates:** 1°51'27"W - 43°20'38"N
**Coordinates:** -1.8575° ; 43.3439°

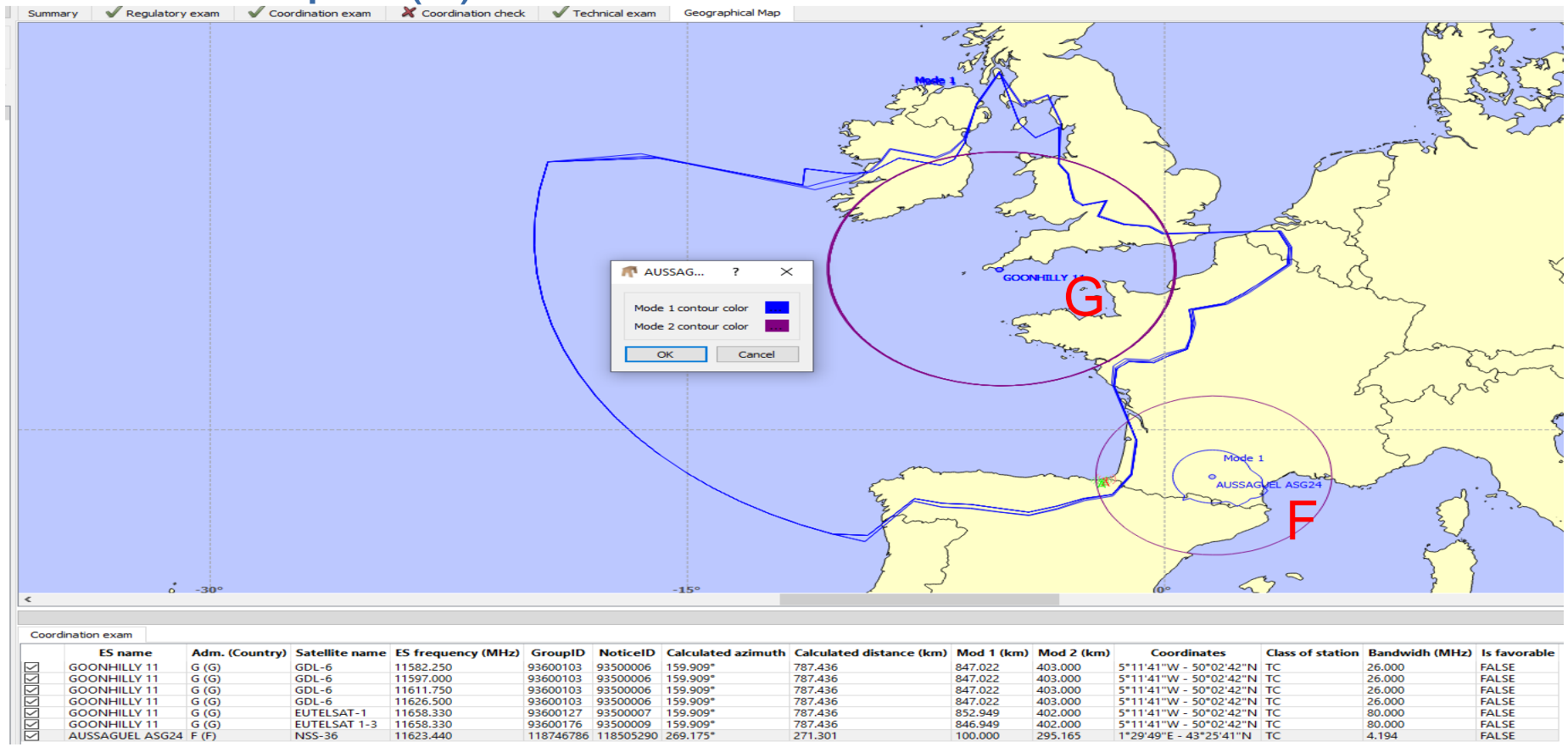
Administrations of UK and F were identified as affected.

✓ **6 earth stations of UK**

✓ **1 earth station of F**

# Coordination under Nos. 9.16 & 9.18 (3)

➢Example (1)




Coordination exam

| ES name | Adm. (Country) | Satellite name | ES frequency (MHz) | GroupID | NoticeID | Calculated azimuth | Calculated distance (km) | Mod 1 (km) | Mod 2 (km) | Coordinates | Class of station | Bandwidth (MHz) | Is favorable |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GOONHILLY 11 | G (G) | GDL-6 | 11582.250 | 93600103 | 93500006 | 159.909° | 787.436 | 847.022 | 403.000 | 5°11'41"W - 50°02'42"N | TC | 26.000 | FALSE |
| GOONHILLY 11 | G (G) | GDL-6 | 11597.000 | 93600103 | 93500006 | 159.909° | 787.436 | 847.022 | 403.000 | 5°11'41"W - 50°02'42"N | TC | 26.000 | FALSE |
| GOONHILLY 11 | G (G) | GDL-6 | 11611.750 | 93600103 | 93500006 | 159.909° | 787.436 | 847.022 | 403.000 | 5°11'41"W - 50°02'42"N | TC | 26.000 | FALSE |
| GOONHILLY 11 | G (G) | GDL-6 | 11626.500 | 93600103 | 93500006 | 159.909° | 787.436 | 847.022 | 403.000 | 5°11'41"W - 50°02'42"N | TC | 26.000 | FALSE |
| GOONHILLY 11 | G (G) | EUTELSAT-1 | 11658.330 | 93600127 | 93500007 | 159.909° | 787.436 | 852.949 | 402.000 | 5°11'41"W - 50°02'42"N | TC | 80.000 | FALSE |
| GOONHILLY 11 | G (G) | EUTELSAT 1-3 | 11658.330 | 93600176 | 93500009 | 159.909° | 787.436 | 846.949 | 402.000 | 5°11'41"W - 50°02'42"N | TC | 80.000 | FALSE |
| AUSSAGUEL ASG24 | F (F) | NSS-36 | 11623.440 | 118746786 | 118505290 | 269.175° | 271.301 | 100.000 | 295.165 | 1°29'49"E - 43°25'41"N | TC | 4.194 | FALSE |

**SNS:** https://www.itu.int/sns/database.html

https://www.itu.int/go/ITUSpaceExplorer

# 3.2 Coordination under No. 9.19 (1)

## ➢Coordination criteria (Appendix 5)

| Reference of Article 9 | Frequency bands (and Region) of the service for which coordination is sought | Threshold/condition | Remarks |
|---|---|---|---|
| No. **9.19** Terrestrial | 11.7-12.7 GHz (see Article **6** of Appendix **30**)<br>12.5-12.75 GHz (terrestrial services in Nos. **5.494** and **5.496** as well as in Regions 2 and 3 in respect of BSS allocation in Region 3)<br>17.7-17.8 GHz (terrestrial services in all three Regions in respect of BSS allocation in Region 2) | i) Necessary bandwidths overlap; and<br>ii) the power flux-density (pfd) of the interfering station at the edge of the BSS service area exceeds the permissible level | Check by using the assigned frequencies and bandwidths<br>(See also Article 6 of Appendix **30**) |

# Coordination under No. 9.19 (2)

## Coordination criteria (Appendix 5)

| Reference of Article 9 | Frequency bands (and Region) of the service for which coordination is sought | Threshold/condition | Remarks |
|---|---|---|---|
| No. **9.19**<br>Terrestrial | 1 452-1 492 MHz<br>2 310-2 360 MHz (terrestrial services in all three Regions in respect of BSS allocation in No. **5.393**)<br>2 520-2 670 MHz (see No. **5.416**)<br>40.5-42.5 GHz<br>74-76 GHz | i) Necessary bandwidths overlap; and<br>ii) the power flux-density (pfd) of the interfering station at the edge of the BSS service area exceeds the permissible level | Check by using the assigned frequencies and bandwidths<br>(See also RoP on No. **9.19**) |

# Coordination under No. 9.19 (3)

## ➢Rules of Procedure 9.19

- ✓ For transmitting IMT stations notified with nature of service "IM" in the frequency band 1 452-1 492 MHz, in Regions 1 and 3: frequency overlap and the power flux-density of −154 dB(W/(m$^2$ · 4 kHz)) at the edge of the service area of non-planned BSS, is calculated using Recommendation ITU-R P.452-18 for 20 % of time;

- ✓ For **all non-IMT stations in the frequency band 1 452-1 492 MHz**, as well as for transmitting terrestrial stations **in other non-planned BSS frequency bands**: frequency overlap and the distance from the location of the terrestrial station to the national border of any country included in the service area of the BSS assignment is **less than 1 200 km.**

# Coordination under No. 9.19 (4)

## ➢Example 1

**BR ID:** 118010749
**Administration: F**
**Administration's unique ID:** 1085719
**Fragment:** NTFD_RR
**Provision:** RR11.2
**Notice type:** T11 / ADD
**Date Rcv:** 28 Feb 2018

**Assigned frequency:** 1485 MHz
**Bandwidth:** 1M00
**Examination category:** NBSS
**Class of station:** FX
**Geographic area:** GUF
**Site name:** REGINA5
**Coordinates:** 52°7'42"W - 4°32'2"N

| Administration | Coordination provision(s) | Status(es) |
|---|---|---|
| B | RR9.19 | COORD REQUIRED |
| GUY | RR9.19 | COORD REQUIRED |
| SUR | RR9.19 | COORD REQUIRED |
| TRD | RR9.19 | COORD REQUIRED |
| VEN | RR9.19 | COORD REQUIRED |

# Coordination under No. 9.19 (5)

- Non-Planned BSS exam is applicable.
  - ✓ Coordination distance: 1200 km.
  - ✓ The following Administrations of space networks are involved : ARS, HOL, ISR, JOR, LUX, MLA, S, UAE, USA.
  - ✓ The following Administrations of countries in the service areas are involved : B, GUY, SUR, TRD, VEN.

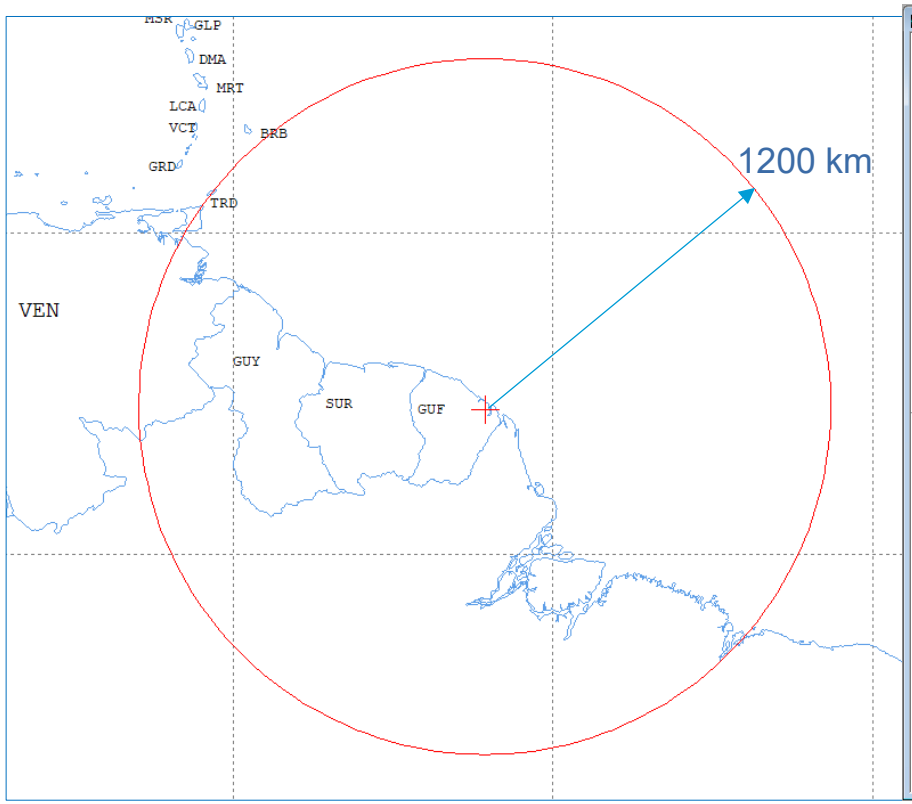
- The following BSS networks are involved.

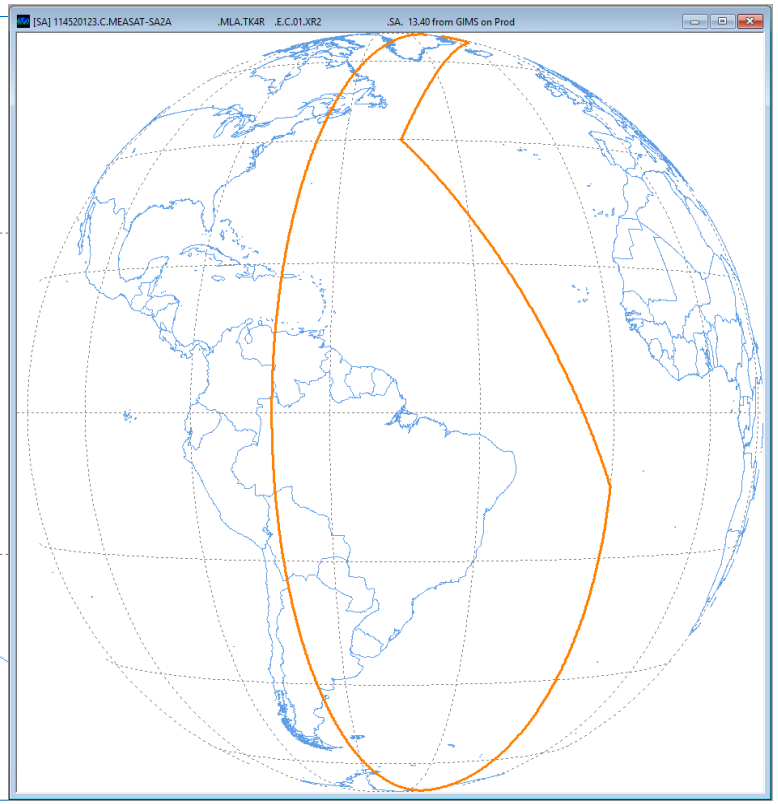
| | | |
|---|---|---|
| AFRIBSS | LUX-G12-1 | MEASAT-SA2B |
| AMS-B7-13 | LUX-G7 | MEASAT-SA3C |
| ARABSAT-9L-1E | LUX-G9-10 | MEASAT-SA4B |
| EMARSAT-12F | LUX-G9-37 | MEASAT-SA4C |
| FUTURA-4 | LUX-G9-38 | NSS-G5-13 |
| JORSAT-11E | LUX-G9-42 | NSS-G6-10 |
| LUX-G10-5 | LUX-G9-49 | NSS-G6-14 |
| LUX-G10-7 | LUX-G9-5 | NSS-G6-7 |
| LUX-G10-8 | LUX-G9-6 | NSS-G7 |
| LUX-G11-2 | LUX-G9-7 | NSS-G7-131W |
| LUX-G11-49 | LUX-G9-8 | NSS-G7-50 |
| LUX-G11-5 | LUX-G9-9 | NSS-G7-83W |
| LUX-G11-7 | MEASAT-LA1B | NSS-G8-137W |
| LUX-G11-8 | MEASAT-SA2A | SIRIUS-5E-8 |

# Coordination under No. 9.19 (6)

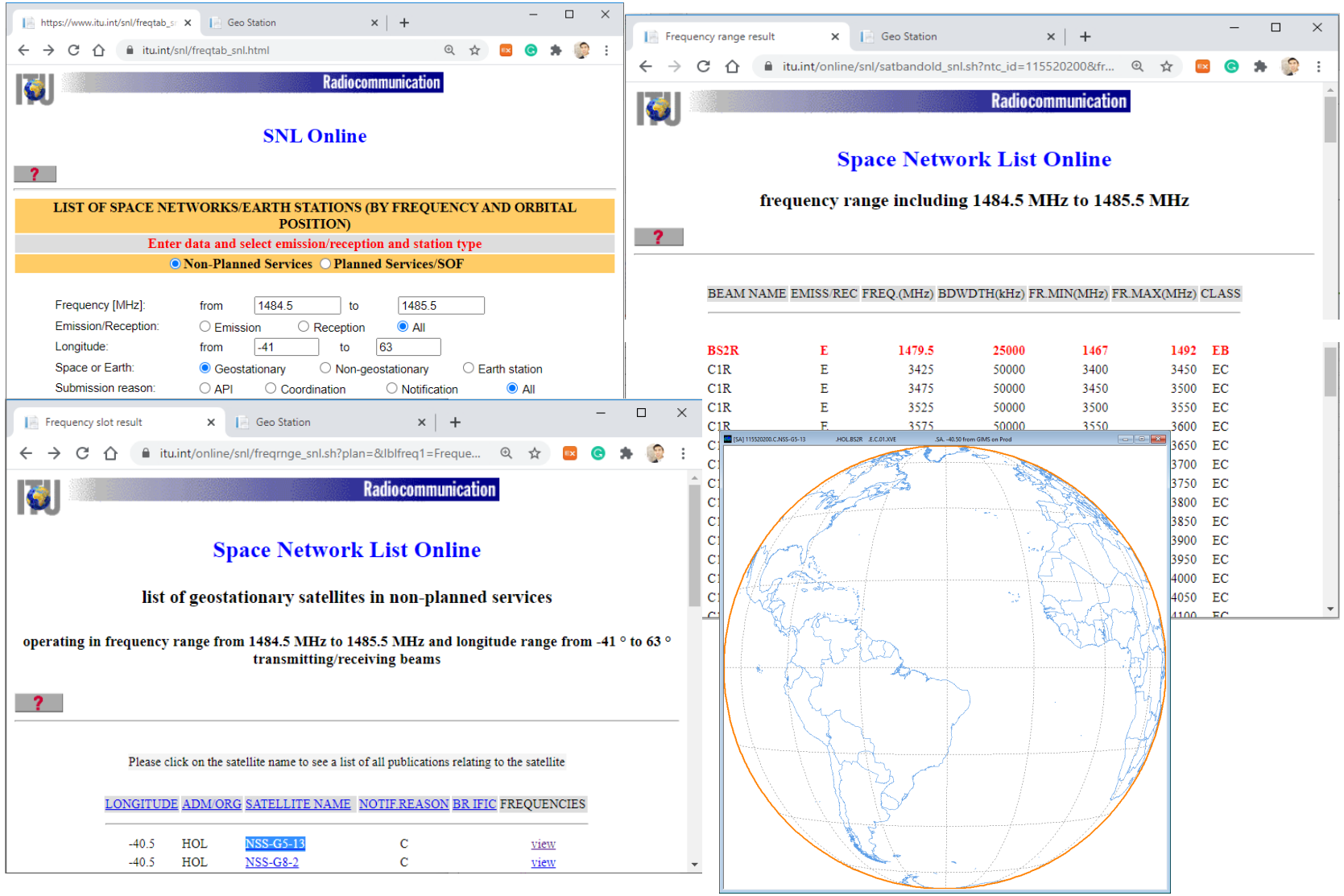
- Example 1
  - ✓ Coord area

- Service area of MEASAT-SA2B



# Coordination under No. 9.19 (7)




https://www.itu.int/snl/freqtab_snl.html

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# 2.5 Mandatory coordination under other provisions (1)

- Coordination required by some WRC Resolutions
  - ✓ e.g. Resolution 612 (Rev.WRC-12) as well as Resolution 150 (WRC-12), Resolution 221 (Rev.WRC-23) and Resolution 168 (Rev.WRC-23) governing HIBS, HAPS.

# 2. 4 Mandatory coordination under other provisions (2)

## ➢Coordination criteria (Res. **612 (Rev.WRC-12)**)

| Reference | Frequency bands (and Region) of the service for which coordination is sought | Threshold/condition |
|---|---|---|
| No. **5.132A**<br>No. **5.145A**<br>No. **5.161A**<br>Res. **612 (Rev. WRC-12)** | 4 438-4 488 kHz<br>5 250-5 275 kHz<br>9 305-9 355 kHz (R1, R3)<br>13 450-13 550 kHz<br>16 100-16 200 kHz<br>24 450-24 600 kHz (R1, R3)<br>24 450-24 650 kHz (R2)<br>26 200-26 350 kHz (R1, R3)<br>26 200-26 420 kHz (R2)<br>39-39.5 MHz (R1)<br>39.5-40 MHz (R3)<br>41.015-41.665, 43.35-44 MHz (No. **5.161A**)<br>42-42.5 MHz (R1) | *resolves 6* of Resolution **612 (Rev. WRC-12) -** that the separation distances between an oceanographic radar and the border of other countries shall be greater than the distances specified in the following table, unless prior explicit agreements from affected administrations are obtained |

# 2. 4 Mandatory coordination under other provisions (3)

## ➢Coordination criteria (Res. 612 – *resolves 6*)

| Frequency (MHz) | Land path (km) | | Sea or mixed path (km) | |
|---|---|---|---|---|
| | Rural | Quiet rural | Rural | Quiet rural |
| 5 (± 1 MHz) | 120 | 170 | 790 | 920 |
| 9 (± 1 MHz) | 100 | 130 | 590 | 670 |
| 13 (± 1 MHz) | 100 | 110 | 480 | 520 |
| 16 (± 1 MHz) | 80 | 100 | 390 | 450 |
| 25 (± 3 MHz) | 80 | 100 | 280 | 320 |
| 42 (± 3 MHz) | 80 | 100 | 200 | 230 |

✓ RoP **5.312A, 5.145A** and **5.161A**:

- As the Bureau has no means for the identification of rural or quiet rural areas, the Board decided that for examination of the notified frequency assignment to a station in the radiolocation service from the view point of its conformity with *resolves* 6 of Resolution **612** (Rev.WRC-12) **the Bureau shall use the separation distances for quiet rural paths listed in Columns 3 and 5, as appropriate, of the Table of *resolves* 6.**

# 2. 4 Mandatory coordination under other provisions (4)

## ➢ Coordination criteria (Footnote for HIBS)

| Reference | Frequency bands (and Region) of the service for which coordination is sought | Threshold/condition |
|---|---|---|
| Resolution **221 (Rev.WRC-23)** (No. **5.388A**) | 1 710-1 980 MHz, 2 010-2 025 MHz and 2 110-2 170 MHz (Regions 1 and 3)<br>1 710-1 980 MHz and 2 110-2 160 MHz (Region 2)<br><br>1710-1 785 MHz in Regions 1 and 2, and 1 710-1 815 MHz in Region 3: ground-to- HIBS direction<br><br>2 110-2 170 MHz: HIBS-to-ground direction | HIBS operating in the frequency band **1 780-1 850 MHz** within **1 135 km** of the border of the territory of other administrations **shall obtain agreement** with all affected administrations **prior to implementation of HIBS** unless otherwise agreed between the administrations concerned; this condition **does not** apply in the countries within the African Broadcasting Area, as described in Nos. **5.10**, **5.11**, **5.12** and **5.13**, and Algeria, Egypt, Libya and Morocco in Region 1, per *Resolves* 1.7 of Resolution **221 (Rev.WRC-23)** |

# 2. 4 Mandatory coordination under other provisions (5)

## ➢ Coordination criteria (Resolutions for HAPS)

| Footnote | Frequency bands (and Region) of the service for which coordination is sought | Threshold/condition |
|---|---|---|
| Resolution **150 (WRC-12)** (No. **5.457**) | 6 440-6 520 MHz (HAPS-to-ground direction) and 6 560-6 640 MHz (ground-to-HAPS direction) | The use of HAPS gateway links in these bands requires explicit agreement with other administrations whose territories are located **within 1 000 km** from the border of an administration intending to use the HAPS gateway links as defined in No.**5.457**. Resolution **150 (WRC-12)** |
| Resolution **168 (Rev.WRC-23)** (No. **5.550D**) | 38-39.5 GHz | *Resolves* 6 and 8 of Resolution **168 (Rev.WRC-23)** |

# 4. Voluntary Coordination of FXM assignments (1)

- When to coordinate?
  - ✓ Foreseen received interference > Permissible interference
- Initiation of the coordination
  - ✓ planning
  - ✓ operating
- General procedure
  - ✓ 1st stage:  Coordination between operators
  - ✓ 2nd stage: Coordination between administrations
  - ✓ 3rd stage:  Coordination with BR's assistance

# Voluntary Coordination of FXM assignments (2)

- Generic coordination criteria (e.g. IMT-2000 base station)

| Item | Formular | 1800 MHz band | 900 MHz band |
|---|---|---|---|
| Bandwidth (B) | | 5 MHz | |
| Temperature (K) | | 290 | |
| Boltzmann Coefficient (k) | | 1.38 x $10^{-23}$ | |
| Noise temp. (No) | =10 log(kTB) | -137 dBW | |
| Noise figure (Nf) | | 5 dB | |
| Protect. criteria (I/N) | | -6 dB | |
| Permissible interference (Ip) | = No+Nf+I/N | -138 dBW | |
| Permissible field stren. (Ep) | = Ip+20*log(f)+77.2 | 34.3 dBµV/m | 28.3 dBµV/m |

- ✓IMT-2000 receiving base station (UTRA FDD Macro) according to ITU-R M.2039

# Voluntary Coordination of FXM assignments (3)

- What to include in a special agreement?
  - ✓ **Frequency range and frequency categories** defined when coordinating or planning (e.g. channeling arrangement)
  - ✓ **Radiocommunication services and systems** concerned, e.g. fixed or mobile service
  - ✓ **Permissible interference level**
    - Open called as **coordination triggering level**, e.g. Etrigger, pfd
    - Usually decided based on internationally, regionally, bi-directionally **agreed documents** (RR, ITU-R Recommendations, regional standard documents)
  - ✓ **Propagation model and interference calculation method** (to be used in the planning stage), e.g. ITU-R P.525, ITU-R P.1546, ITU-R P.452, etc. agreed between the countries concerned

# Voluntary Coordination of FXM assignments (4)

- What to include in a special agreement?
  - ✓ Coordination **procedure method** (preferential frequencies, channeling separations, protection at the border, protection of specific stations)
  - ✓ **Exchange of** appropriate spectrum management **information**
  - ✓ **Measurement method** (to be used in the operation stage)
  - ✓ A means of resolving instances of **unexpected harmful interference**
    - Contact points in Administrations
    - Contact points in Operators
    - Time limit for reporting/resolving the instances
  - ✓ Others agreed

# 5. Conclusions

- The radio **signal spillover** is unavoidable.
- **Mandatory** (Article **9**, Plans, Resolutions or Article 5) or **Voluntary** (Article **6** special agreement applies) coordination are required.
- The best solution is to **have an agreement on channeling arrangement** between the administrations concerned.
- For frequencies not having channeling arrangements the practical solution is to coordinate between administrations taking into account **the agreed criteria and methods**.
- In accordance with No. **6.7** of Article **6** (special agreement) of Radio Regulations, if two or more Member States coordinate the use of individual frequencies in any of the frequency bands covered by Article **5**, before notifying the frequency assignments concerned, **they shall in all appropriate cases inform the Bureau of such coordination**.

# Thank you!

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# ITU-R references for voluntary coordination

- Rules of Procedure, Part B4 – coordination distances for protection of FS/MS vs. FS/MS in the bands 9kHz-28000kHz
- ITU-R Handbook on Guidance for bilateral/multilateral discussions on the use of frequency range 1 350 MHz – 43.5 GHz by fixed service systems
- Rec. ITU-R SM.1049 A method of spectrum management to be used for aiding frequency assignment for terrestrial services in border area
- Rec. ITU-R SM.1132 General principles and methods for sharing between radiocommunication services or between radio stations