



ULTIMATE SOLUTIONS FOR TELECOMMUNICATIONS

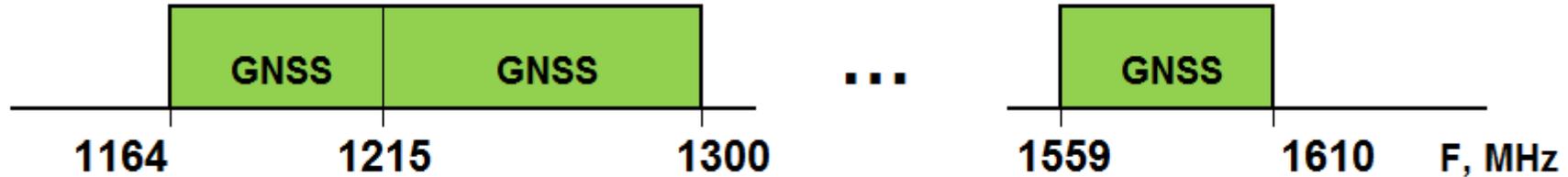
# Proposal to update Recommendation 8A. 2.1 based on the results of the Joint Task Group 4-5-6-7 ITU-R meetings

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## Basic GNSS frequency bands



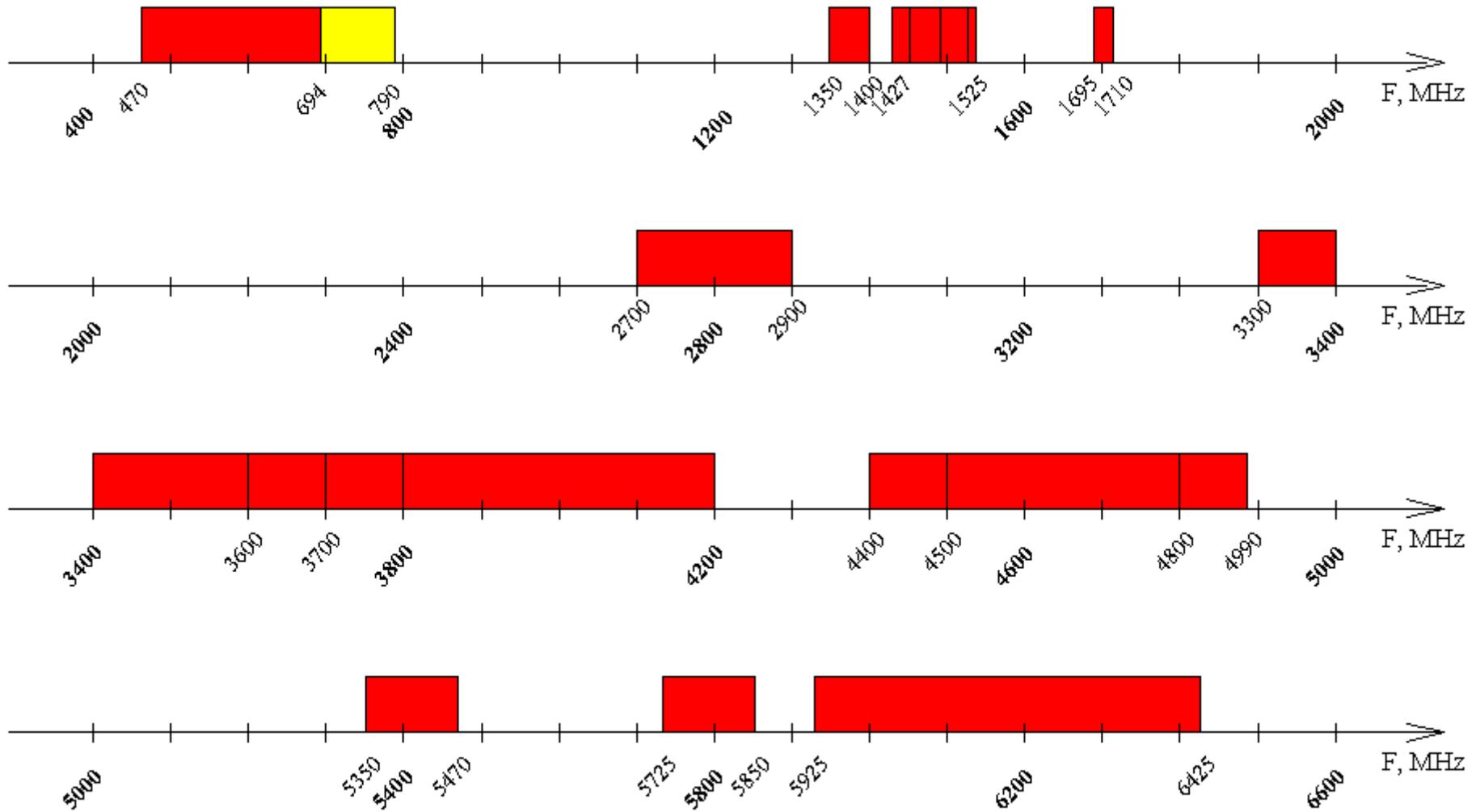
**Global navigation satellite systems operate in the radionavigation satellite service**

**No.1.43 Radio Regulations: «radionavigation-satellite service is a radiodetermination-satellite service used for the purpose of radionavigation»**

**No.4.10 Radio Regulations: «Member States recognize that the safety aspects of radionavigation and other safety services require special measures to ensure their freedom from harmful interference; it is necessary therefore to take this factor into account in the assignment and use of frequencies»**

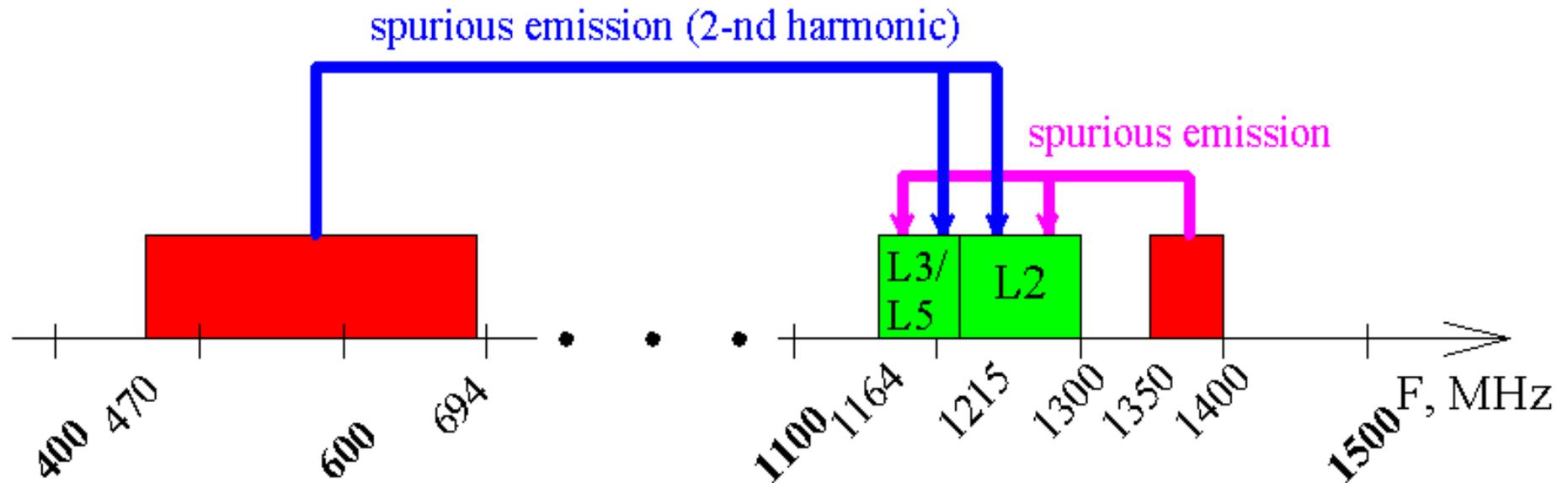
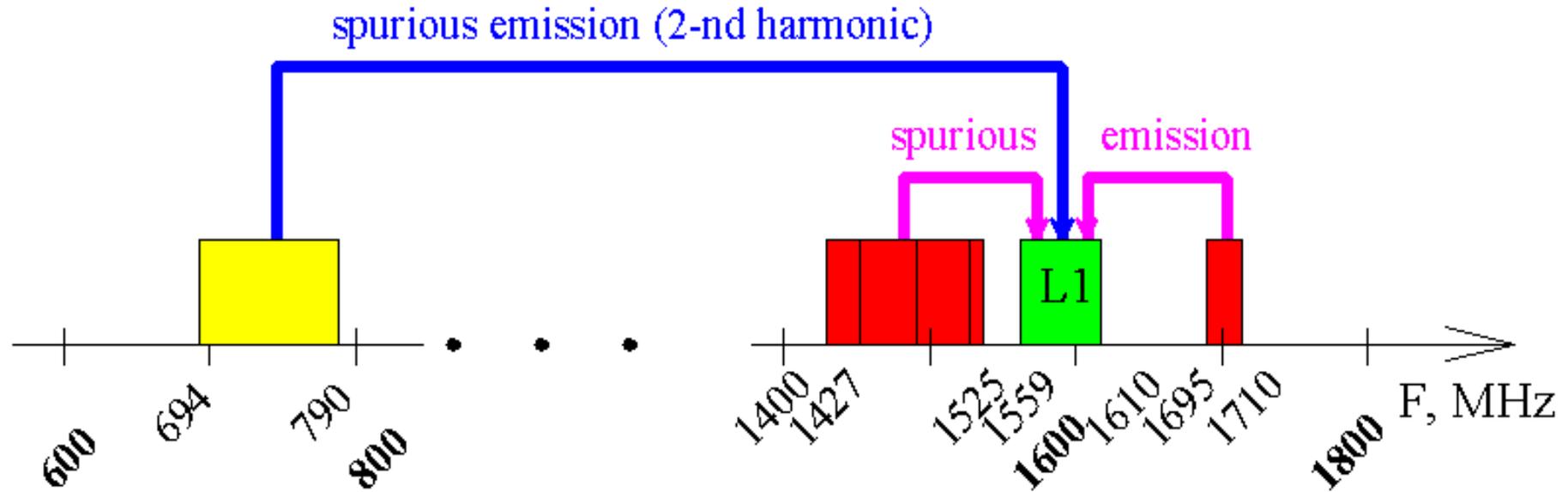


# Candidate IMT frequency bands in accordance to 1.1 and 1.2 agenda item WRC-15



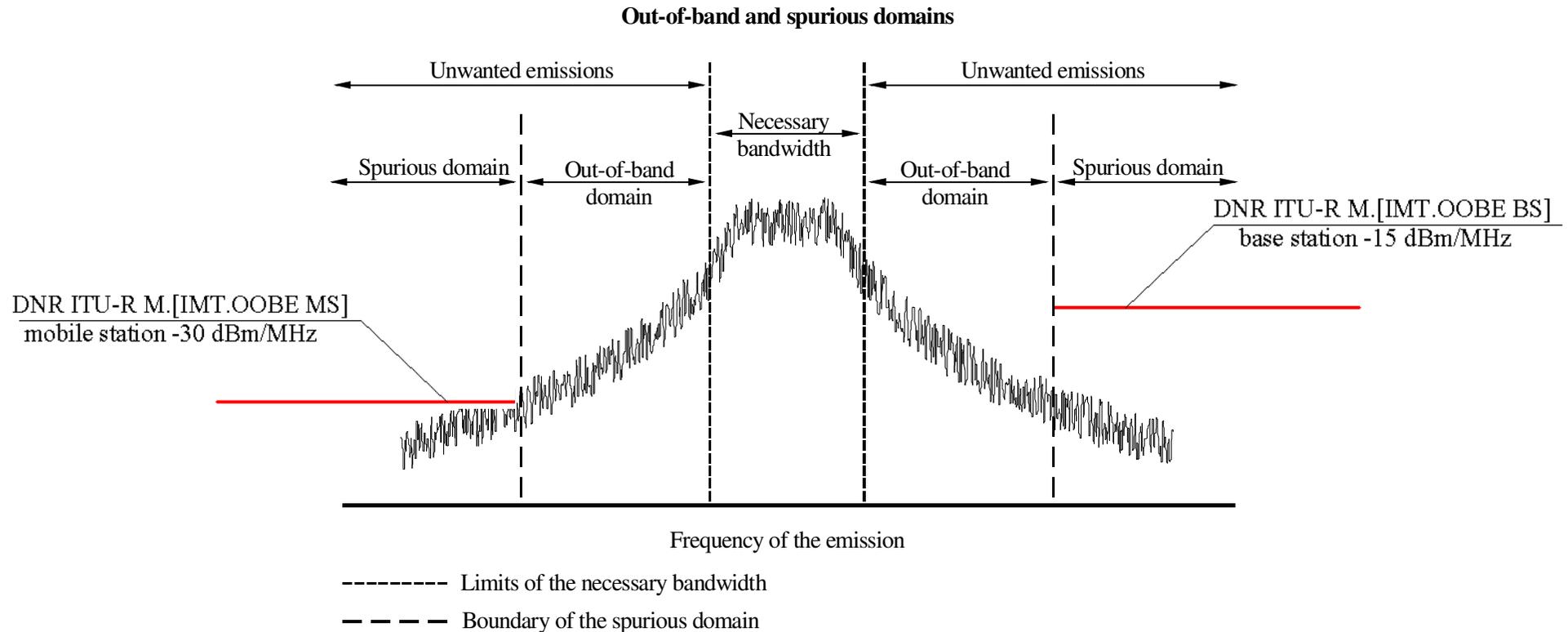


# Potential impact from IMT frequency bands to GNSS frequency bands





# IMT unwanted emissions limits



**Draft New Recommendation ITU-R M.[IMT.OOBE MS] «Generic unwanted emission characteristics of mobile stations using the terrestrial radio interfaces of IMT-Advanced»**

**Draft New Recommendation ITU-R M.[IMT.OOBE BS] «Generic unwanted emission characteristics of base stations using the terrestrial radio interfaces of IMT-Advanced»**



## Interference evaluation from IMT (mobile station) on GNSS

|   | L1   |      | L2   |      | L3   |      |
|---|------|------|------|------|------|------|
| Spurious emissions level (dB(W/MHz))  | -60  |      |      |      |      |      |
| Maximum receiver antenna gain (dBi)   | 6    | 6    | 6    | 6    | 7    | 3    |
| Acquisition mode threshold power density level of aggregate wideband interference at the passive antenna output (dB(W/MHz)) | -142 | -148 | -127 | -156 | -146 | -156 |
| Power density level at the antenna output (dB(W/MHz))   | -54  | -54  | -54  | -54  | -53  | -57  |
| Required additional attenuation (dB)  | 88   | 94   | 73   | 102  | 93   | 99   |

The required additional attenuation for the mobile stations ranges from 73 to 102 dB. This additional attenuation is provided by a separation distance from 9 m to 2.5 km, respectively.



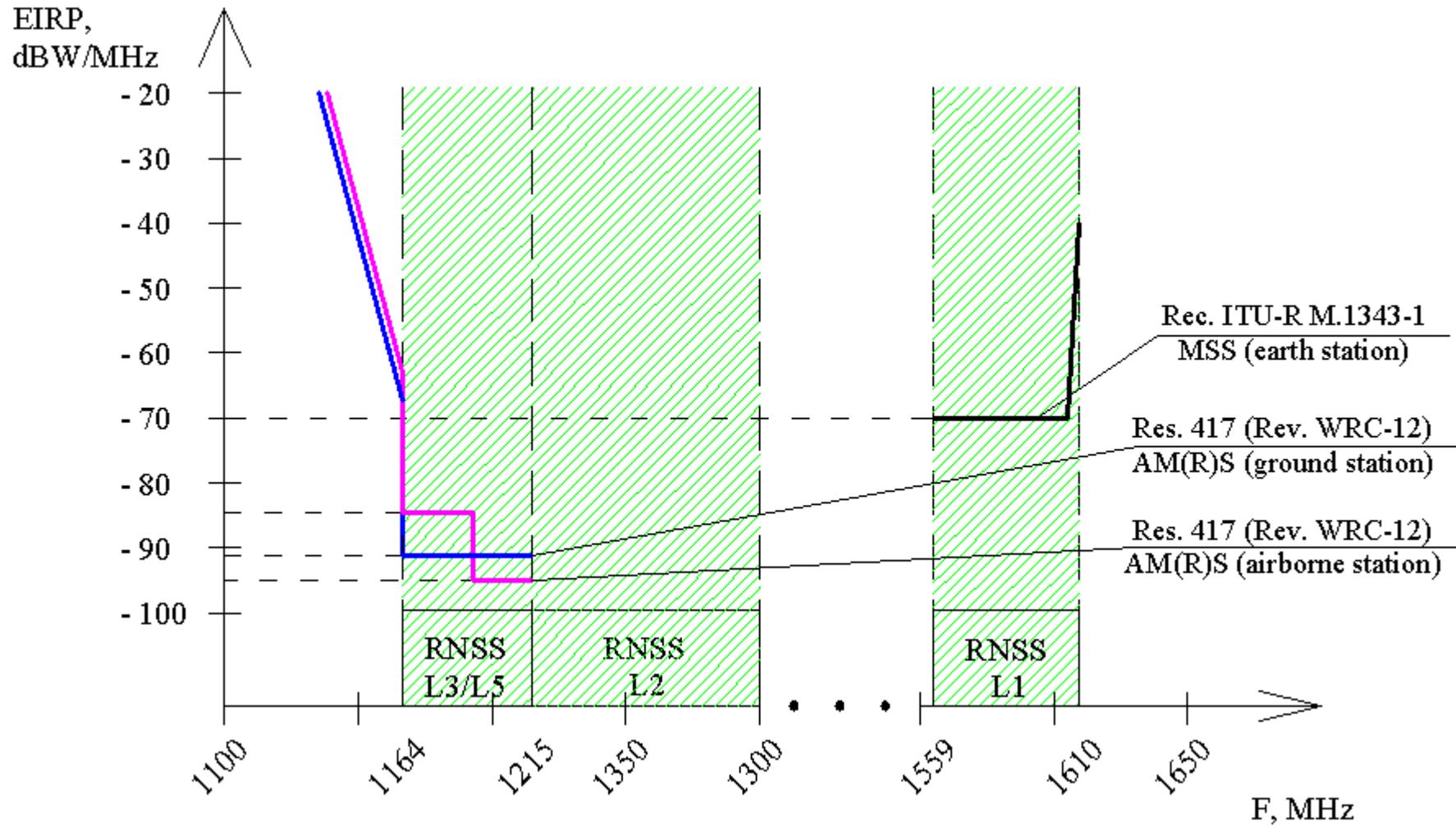
## Interference evaluation from IMT (base station) on GNSS

|   | L1   |      | L2   |      | L3   |      |
|---|------|------|------|------|------|------|
| Spurious emissions level (dB(W/MHz))  | -45  |      |      |      |      |      |
| Maximum receiver antenna gain (dBi)   | 6    | 6    | 6    | 6    | 7    | 3    |
| Acquisition mode threshold power density level of aggregate wideband interference at the passive antenna output (dB(W/MHz)) | -142 | -148 | -127 | -156 | -146 | -156 |
| Power density level at the antenna output (dB(W/MHz))   | -39  | -39  | -39  | -39  | -38  | -42  |
| Required additional attenuation (dB)  | 103  | 109  | 88   | 117  | 108  | 114  |

**The required additional attenuation for the mobile stations ranges from 88 to 117 dB. This additional attenuation is provided by a separation distance from 500 m to 14 km, respectively.**

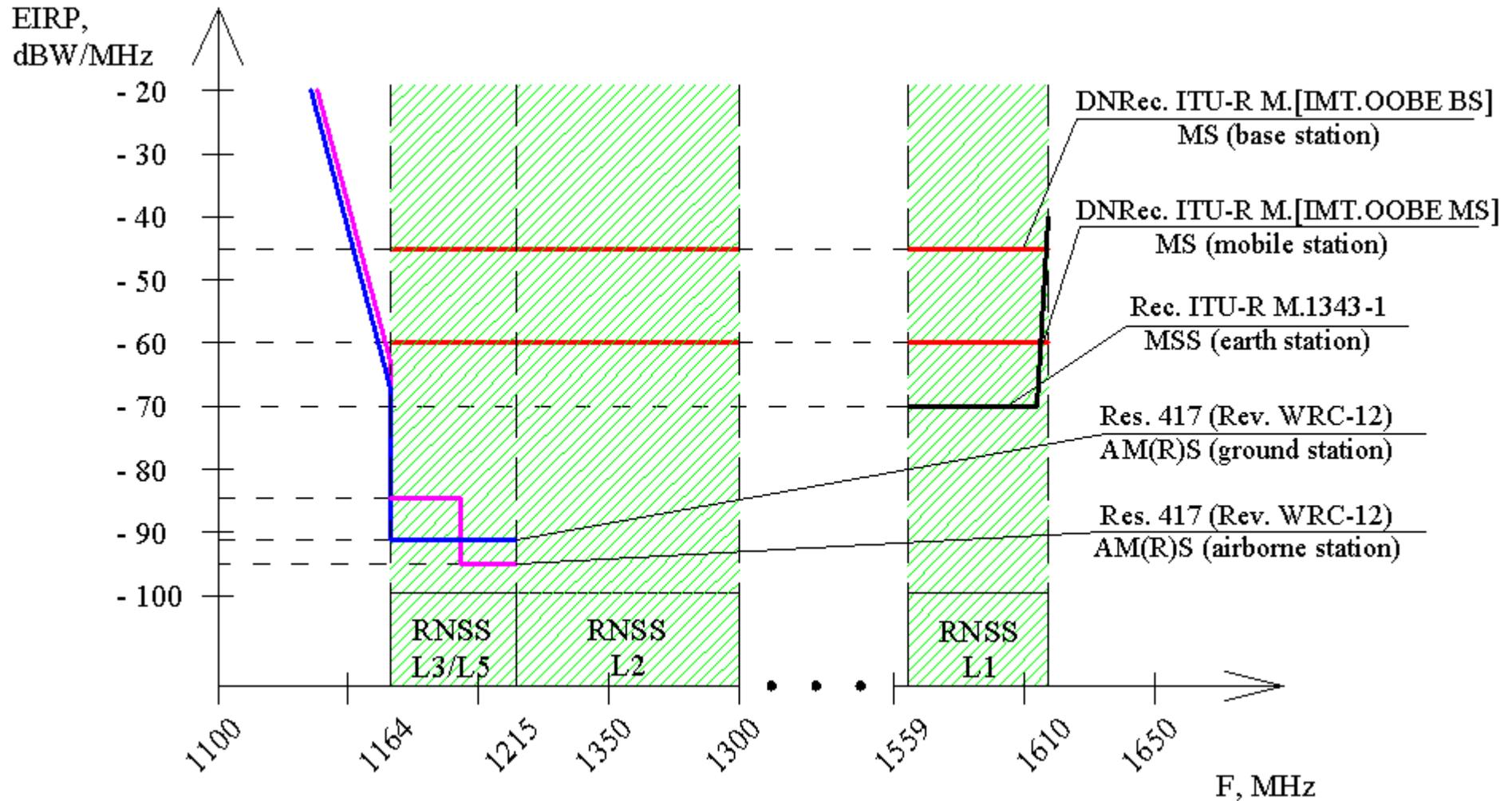


## Similar ITU-R studies





# Comparison of limitations for IMT with similar ITU-R studies





## Conclusions and proposals

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It is proposed to consider the modifications of Recommendation 8A.2.1 :

### «IMT-GNSS Compatibility

ICG members are encouraged to actively participate in the ITU-R and regional WRC-15 preparatory work on new IMT spectrum allocations (~~including JTG 4-5-6-7 until August 2014~~), to ensure that proposals do not impact existing and future GNSS operations. ICG members are strongly recommended not to support the use of the frequency bands 470-694 MHz, 694-790 MHz, 1350-1400 MHz, 1427-1525 MHz and 1695-1710 MHz for IMT frequency bands without additional restrictions of unwanted emissions in order to ensure the protection of GNSS from IMT harmful interference. Members may also consider forming links with other satellite groups already defending satellite spectrum».



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Thank you for your attention!

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