



IMT-MSS coexistence in L-band

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Work on IMT-MSS coexistence in L-band

- 1427-1518 MHz identified for IMT at WRC-15
 - WRC Resolution 223 invited studies of compatibility between IMT in 1492-1518 MHz and MSS in 1518-1525 MHz
- ITU-R Recommendation M.1036 - frequency arrangements
- CEPT developed regulatory framework
 - including solutions for coexistence with MSS above 1518 MHz
 - ECC Decision (17)06, ECC Report 263, ECC Report 299
- Work in ITU-R has been dragging on for > 6 years!
 - Work on draft ITU-R Report completed some time ago
 - Arguments about draft ITU-R Recommendation still continuing
- APT Report planned to reflect ITU-R work

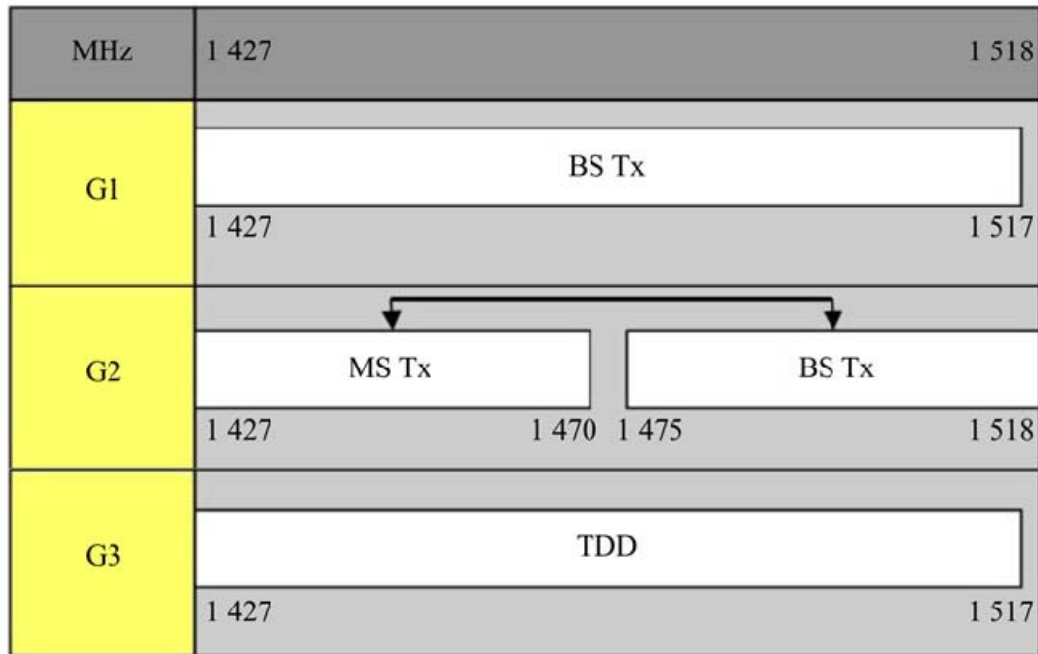


IMT-MSS coexistence in L-band

- Solutions exist for coexistence between IMT and MSS in L-band
 - e.g. see CEPT framework
- Main issues are due to poor performance of MSS earth station (MES) receivers
- Balanced solution needed (technical baseline)
 - Blocking characteristics of MES receivers
 - Unwanted emissions from IMT base stations
- PFD limits can be used (in addition to technical baseline) to ensure compatibility in sensitive areas at airports and seaports, on national basis
- Solutions for 1518-1525 MHz also work above 1525 MHz



Frequency arrangements in 1427-1518 MHz

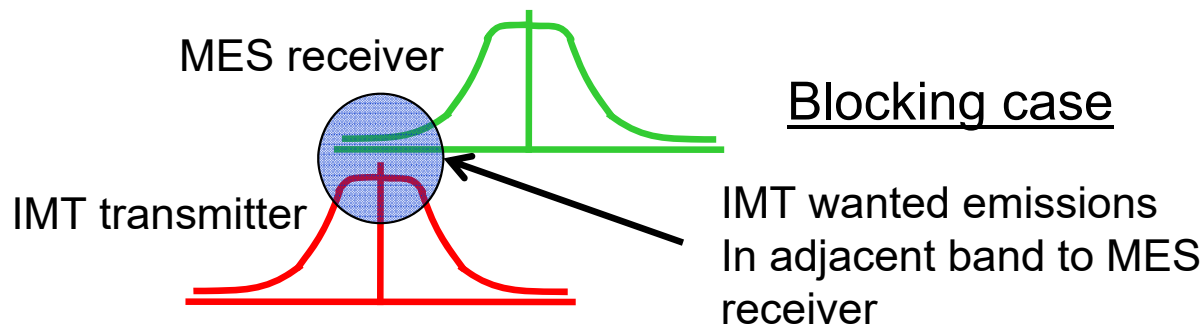
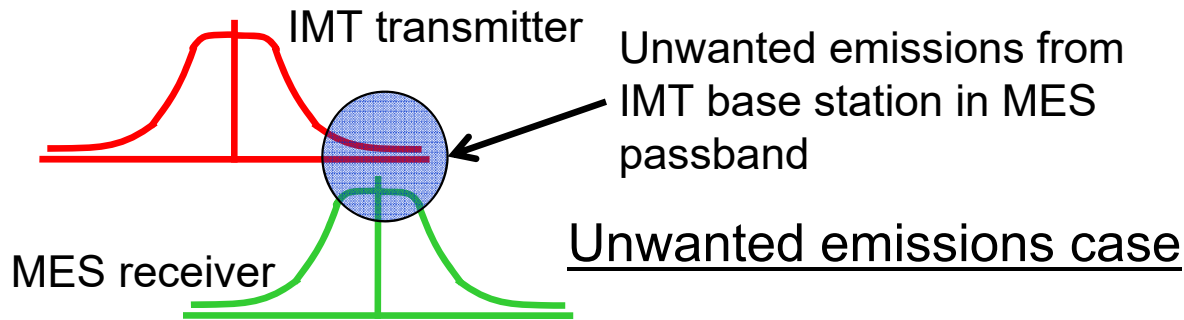


M.1036-04

SDL and FDD both have IMT base station transmissions at top of band, TDD also has IMT UEs



Two possible interference mechanisms



Main coexistence issues between IMT and MSS in adjacent band are due to blocking performance of MES receivers



Technical conditions in ECC Decision

Technical baseline requirements in ECC Decision (17)06

- Based on compatibility studies in ECC Report 263

Balanced technical requirements on both IMT and MSS

- Blocking requirement for MES receivers = -30 dBm
- Unwanted emissions limit for IMT base stations = -30dBm / MHz (above 1520 MHz)



PFD limits may be implemented on national basis

- In addition to technical baseline requirements
- ECC Report 299 contains example PFD limits that may be used to enhance compatibility in sensitive areas at airports and/or seaports

e.g. PFD limits for IMT base stations transmitting multiple channels (proportionate case)

Phase	Phase 1			Phase 2		
	PFD limit for BS emissions in 1492-1502 MHz (dBm/m ²)	PFD limit for BS emissions in 1502-1512 MHz (dBm/m ²)	PFD limit for BS emissions in 1512-1517 MHz (dBm/m ²)	PFD limit for BS emissions in 1492-1502 MHz (dBm/m ²)	PFD limit for BS emissions in 1502-1512 MHz (dBm/m ²)	PFD limit for BS emissions in 1512-1517 MHz (dBm/m ²)
Ports	-12.9	-12.9	-27.9	No limit required	2.1	-7.9
Airports	-12.9	-12.9	-27.9	No limit required	2.1	-7.9



Geographic separation required



The above map shows area where 1512-1517 MHz will not, or only with extreme difficulty, be usable until January 1st 2025 (light green areas) and after January 1st 2025 (grey areas)

e.g. Denmark decided to have PFD limits for their international airports but no PFD limits for maritime, as this would have severely impacted the whole country (coastline is covered by maritime VHF)



Work on draft ITU-R Recommendation

- Working document towards PDN Recommendation under development in ITU-R WPs 4A and 5D
 - Based on compatibility studies in draft ITU-R Report
- Guidance for compatibility between IMT in 1492-1518 MHz and MSS in 1518-1525 MHz, in line with WRC Resolution 223
 - Measures in recommendation may be adopted by administrations on national basis
- Measures for 1518-1525 MHz will also work above 1525 MHz
- Work has dragged on for many years
- Draft ITU-R Report has been stable for some time, and could be finalised, but being held up



Conclusions

- Solutions exist for coexistence between IMT and MSS in L-band
 - e.g. see CEPT framework in ECC documents
- Main issues are due to poor performance of MES receivers
- Balanced technical baseline solution
 - Blocking characteristics of MES receivers
 - Unwanted emissions from IMT base stations
- PFD limits can be used (in addition to technical baseline) to ensure compatibility in sensitive areas at airports and seaports, on national basis
- Solutions/measures for 1518-1525 MHz also work above 1525 MHz