



Updates on WP5D interim meeting

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WP5D Interim meeting

AI 1.1

- Protection of AMS/MMS from other stations and review pfd on IMT stations in 4 800-4 990 MHz band

AI 1.2

- IMT identification in 3, 6-7, 10 GHz bands

RR21.5

- Verification and revision of limits in RR21.5 applicable on stations having AAS in terrestrial and space sharing bands

Background on AI 1.1

AI 1.1

- ✓ WRC-15 established RR No. 5.441B identifying IMT in Cambodia, Lao P.D.R. and VietNam in the 4 800-4 990 MHz frequency band
- ✓ Protection limits on pfd produced by IMT station up to 19 km above sea level at 20 km from the coast in order to protect AMS.
- ✓ This pfd criterion was subject to review at WRC-19. WRC added MMS stations also.
- ✓ IMT to be implemented after WRC-2019

Background on AI 1.1

AI 1.1

- ✓ During WRC19 cycle, ITU-R carried out but could not finalize studies and submitted its report to WRC-19.
- ✓ WRC-19 updated footnote RR No. 5.441B and added new countries (now footnote includes 40 countries Brazil, China, Russia, Iran, Korea, South Africa etc.)
- ✓ 11 of these countries (incl Brazil, China, Russia, VietNam, etc.) the pfd criterion was deactivated.
- ✓ Diverging views on whether or not to apply a pfd criterion, WRC-23 was invited to consider possible measures to address protection of AMS/MMS from other stations located within national territories, and to review the pfd criterion

Development during WP5D Interim

AI 1.1

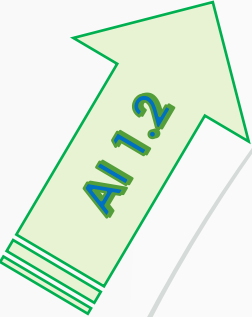

- ✓ RR No. **5.441B** provides a pfd limit applicable in the band 4 800-4 990 MHz based on assumptions relevant to AMS
- ✓ No. **5.441B** protects MMS operations, however, it should be confirmed, based on the studies in WRC-23, whether measures are required for the protection of MMS.
- ✓ New Report on CONDITIONS is being developed.
- ✓ There were studies from Russia, USA, China, France, IAFI
- ✓ IAFI, Russia supported removal of pfd mask however keep RR9.21.
- ✓ USA, France are supportive of pdf mask and coordination under RR 9.21
- ✓ No country has jurisdiction over the use of spectrum in international airspace/waters
- ✓ No study is conclusive on revision/applicability of pfd

Development during WP5D Interim

AI 1.1

- ✓ One of the studies suggested pfd required but not that much strict. It may be ranging between -105.57 to -139.57 (dB(W/(m² · MHz))) for AMS and -114.57 to -124.57 (dB(W/(m² · MHz))) for MMS protections.
- ✓ **Way forward:**
 - ❑ Many Reg3 countries are already in FN having IMT in this band
 - ❑ **View need to be taken on:**
 - ❖ Neutral approach
 - ❖ Support pfd mask as well as No. 9.21 for protection of AMS and or MMS
 - ❖ Support removal/revision↓ of pfd mask but keeping No. 9.21

Background on AI 1.2

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- ✓ To meet IMT requirements in mid-bands, this AI introduced by WRC19, identification of IMT incl. additional MS in bands:
 - ❑ 3 600-3 800 MHz and 3 300-3 400 MHz (Region 2);
 - ❑ 3 300-3 400 MHz (amend footnote in Region 1);
 - ❑ 7 025-7 125 MHz (globally);
 - ❑ 6 425-7 025 MHz (Region 1);
 - ❑ 10.0-10.5 GHz (Region 2).
 - ✓ Sharing and compatibility studies to protect in Band and adjacent band services allocated on a primary basis, without imposing additional regulatory or technical constraints on those services.

Background on AI 1.2

AI 1.2

- ✓ Useful for IMT services which might be difficult to be implemented using lower or higher frequency bands
- ✓ This will add on greater flexibility for Member states in adoption of suitable frequency bands for IMT subject to sharing and compatibility studies
- ✓ Since 3.3-3.4 GHz (Reg1 & 2), 3.6-3.8 GHz (Reg2), 6 GHz (Reg1) and 10 GHz (Reg2), so India has concern in 7 GHz band (globally) only while keeping close watch on 6 GHz band developments.

Development during WP5D Interim

- ✓ India submitted CPM text on 7 GHz in Section-4 and 5 of the Chapter 1 on this AI regarding Methods and Regulatory & procedural considerations.
- ✓ Section 5 contains identification of IMT through FN & Res in 7 GHz or part thereof.
- ✓ There were contributions from USA, Russia, Brazil, UAE, India, GSOA, etc. on CPM text in this AI. Sharing study proposals were there from France, Germany also.
- ✓ Brazil and CME & al have submitted IMT text in 6-7 GHz and was in sync with Ind proposal. CME without any condition whereas Brazil and Ind with pfd condition through Res as per sharing studies.

Development during WP5D Interim

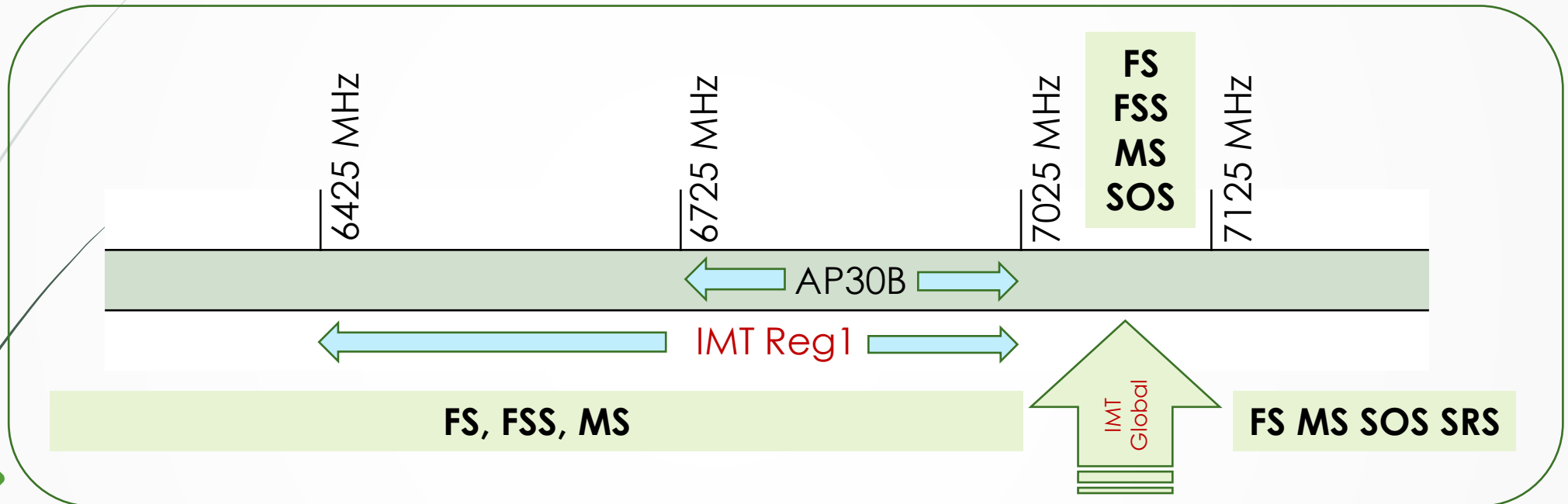
- ✓ Different studies for the concerned bands based on different assumptions which are showing different results.
- ✓ Many of them are showing that IMT identification is possible with certain pfd conditions and/or protection distance to protect other incumbent and adjacent band services, whereas some are showing difficulties in co-existence.
- ✓ CPM text in 7025-7125 MHz has been included as proposed by India and will be further discussed at next #41th WP5D meeting.

Development during WP5D Interim

- ✓ In CPM Text as well as in sharing studies 6-7 GHz bands have been merged. Sharing studies are mostly focused in 6 GHz only. Some of the IMT parameters for 6-7 GHz have been taken same as of in 3-6 GHz range.
- ✓ Its creating complexities and likely to have wrong outcome since areas, set of service in-band and adjacent band and Plan band having different regulatory concerns.

Development during WP5D Interim



- ✓ Issues in CPM text and sharing studies in 6-7 GHz under AI 1.2



✓ Way forward

- CPM text revision may be proposed to WP5D#41 in Sec-3 also indicating 6 and 7 GHz band separately for analysis as well as sharing studies.

Background on RR 21.5

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- ✓ WRC19, as an urgency, referred two issues to CPM23-1 through BR:
 - ✓ (i) Update of Aeronautical Provisions in RR
 - ✓ (ii) Revision, replacement of the limit specified in RR No. 21.5 on IMT stations using AAS, with a view to revise or replace pfd levels for such stations in **Table 21-2** related to terrestrial and space services sharing frequency bands.
 - ✓ Study verification of RR No. 21.5 regarding the notification of IMT stations using AAS.
 - ✓ There are two approaches : Opn1 and Opn2
 - (i) TRP with a reference bandwidth / Change No. 21.5 to be a limit on TRP of a station applied to a fixed reference bandwidth
 - (ii) No change to applying RR. No. 21.5 (based on its original intent and application, the limit applies to the conducted power delivered by a single transmitter)

Development during WP5D Interim

(i) Option-1:

- ✓ The value of the “total radiated power” (TRP), defined as “*the integral of the power transmitted from all antenna elements in different directions over the entire radiation sphere*”.
- ✓ There were studies from France, LUX having ref BW as 200 MHz and then extrapolating to other 3GPP BW (50, 100, 400 MHz) (through Bandwidth Adjustment Factor (BAF)). These studies shows that limit is to be applied on TRP instead of existing limits on conducted power.
- ✓ PFD Limits in Table 21-2 and RR 21.5 thus need to be revised for 26 GHz band or any such station having active antenna system. Till WRC23, BR may develop RoP according to TRP and inform Members, notify IMT Stations accordingly.
- ✓ This approach was suggested by **France, Russia, Germany, China and Japan. It is in favour of satellite services with extra protection to satellite receivers.**

Development during WP5D Interim

(ii) Option-2:

- ✓ There were studies from USA, UAE in support of no change in pfd levels in RR 21.5 stating that the conducted power can be verified and calculated through reverse process. So limits as available can be applied on IMT stations having active antennas.
- ✓ This approach was suggested by **USA, UAE, Korea, UK and New Zealand. It is in support of IMT.**
- ✓ USA/UAE study say that the IMT AAS base station emissions/interference towards satellites are not governed by the TRP of the station, but by the conducted power per individual transmitter of the station. This is in accordance with RR No. 21.5, which applies to “The power delivered by a transmitter to the antenna of a station”.

Developments during WP5D Interim

Way forward:

- ✓ Both the approaches are on extreme end and sensitive towards IMT stations having AAS (especially mmWave) as well as satellites services.
- ✓ Can keep watch on the developments.
- ✓ Appropriate if some compromised way be achieved while supporting revision of RR 21.5 values in Table 21-2 while calculating the values of interference considered in the studies, in the directions of the satellite receivers instead of aggregation on a sphere of all active antenna elements

THANKS

