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Session 2 – Fixed, Mobile and Broadcasting issues

WRC-23 agenda item 1.3

Usman Aliyu Mahmud
Co-rapporteur of Chapter 1, CPM23

Agenda Item Overview

Fixed Mobile and Broadcasting Issues

AI 1.3 is to consider primary allocation of the band 3 600-3 800 MHz to mobile service within Region 1 and take appropriate regulatory actions, in accordance with Resolution **246 (WRC-19)**;

Resolution **246 (WRC-19)** – Requested for Studies to consider possible allocation of the frequency band 3 600-3 800 MHz to the mobile, except aeronautical mobile, service on a primary basis within Region 1.

Summary of Studies

Section 1/1.3/3 contains a summary of the compatibility and sharing studies between the MS and the FSS and FS that were conducted before the current study cycle. It also summarises seven studies that have been conducted in the current cycle under WRC-23 agenda item 1.3.

Four methods to satisfy this agenda item are proposed in Section 1/1.3/4:

–Method A

–Method B

–Method C

–Method D

All methods support suppression of Res.246 of WRC-19.

Seven compatibility and sharing studies were conducted between FSS and MS and one study between FS and MS at the current WRC-23 cycle with a summary of some of the parameters and assumptions used shown in the next slides.

Summary of Studies MS and FSS

	Study A	Study B	Study C	Study D	Study E	Study F	Study G
Scenario	In-band	In-band	In-band	In-band	In-band	In-band and adjacent band	In-band
Methodology	Statistical	Statistical	Statistical	Statistical	Statistical	Statistical	Deterministic (single entry) and Statistical
Propagation Model	Rec. ITU-R P.452 with 50% time, no terrain data	Rec. ITU-R P.2001 random time %, no terrain data	Rec. ITU-R P.452 with 20% time, no terrain data	Rec. ITU-R P.452 with random time %, terrain data	Rec. ITU-R P.2001 with random time %, no terrain data	AAS: Rec. ITU-R P.452 with random time %	Non-AAS: Rec. ITU-R P.452 with 20% for long-term and 0.005% for short term, terrain data
Clutter Model	Rec. ITU-R P.2108 at mobile BSs & ES / mobile BSs only, random distribution	Rec. ITU-R P.2108 at mobile BSs / mobile BS & ES , random distribution	Rec. ITU-R P.2108 at mobile BSs and ES, random distribution	Rec. ITU-R P.2108 at mobile BSs, random distribution	Rec. ITU-R P.2108 at mobile urban BSs, (two cases: 100% of urban BSs, 50% of urban BSs), random distribution	AAS: Rec. ITU-R P.2108 at 50% of mobile BSs, random distribution	Non-AAS: Rec. ITU-R P.452
Protect Dist. Long Term		20 Km for FSS ES antenna dia. (3m), 30 Km for FSS ES antenna dia. (32m) & 1 Km for FSS ES with sheilding	4.5 – 7.5 Km	Atmost few tens of Kms based dependent on case by- case scenario	24 Km for between FSS ES and MS BS in Urban & 30 Km b/w FSS ES and MS BS in Suburban	79.5 – 149 Km	150 – 218 Km
Protection Dist. Short Term			4.5 - 7.5 Km			248 – 420 Km	460 – 505 Km
Protection Dist. Considering both sides clutter loss	1- 11.7 Km long term & 1.5 – 27 km short term						
Protection Dist. Considering MS clutter loss	9- 39.3 Km long term & 7.5- 39 Km short term						

Summary of Study MS and FS (One Study Only)

Study (MS-FS)		Urban Scenario	Suburban Scenario
Propagation Model	Rec. ITU-R P.452		
Clutter Model	Rec. ITU-R P.2108		
Protection Distance in the direction of FS points towards MS (60m FS Ant. Height)		65 Km	66.2 Km
Protection Distance in the direction of FS points towards MS (20m FS Ant. Height)		26 Km	31.2 Km
Protection Distance in the direction of FS facing away MS (60m FS Ant. Height)		1 Km	2 Km
Protection Distance in the direction of FS facing away MS (20m FS Ant. Height)		<1 Km	1 Km

Methods for A.I 1.3

Method A	No Change to RR

Methods	Upgrade of the allocation of 3 600-3 800 MHz to the mobile, except aeronautical mobile, service on a primary basis within Region 1	Identification for IMT	Alt. C1	Alt. C2	Alt. C3	Alt. C4	Alt. C5
B	√						
C	√		recognizes the need of upgrading the allocation of the frequency band 3 600-3 800 MHz to the mobile, except aeronautical mobile, service on a primary basis in Region 1, subject to agreement to be obtained under RR No. 9.21. This Alternative proposes the same technical and regulatory conditions as for the frequency band 3 400-3 600 MHz (except IMT identification). This upgrade to be done while ensuring the protection of existing primary services. This objective could be reached by adopting the same technical and regulatory conditions applicable to the frequency band 3 400-3 600 MHz, in particular the pfd limit of -154.5 dB(W/(m² · 4 kHz)) at 3 m above ground not to be exceeded for more than 20% of time at the border.	recognizes the need of upgrading the allocation of the frequency band 3 600-3 800 MHz to the mobile, except aeronautical mobile, service on a primary basis in Region 1. This upgrade to be done while ensuring the protection of existing primary services. This objective could be reached by adopting particular conditions in a footnote to the RR, in particular the pfd limit of -154.5 dB(W/(m² · 4 kHz)) at 3 m above ground not to be exceeded for more than 20% of time at the border.	supports the upgrade to a mobile, except aeronautical mobile, service on a primary basis in the frequency band 3 600-3 800 MHz, or parts thereof, in Region 1, while recognising the need of the appropriate protection of the FSS at the border of each country (specifically with the implementation of a pfd limit, applicable to stations of the mobile service, of −154.5 dB(W/(m2 · 4 kHz)) at 3 m above ground not to be exceeded for more than 20% of time at the border of the territory of any other administration).	proposes to upgrade the allocation of the mobile, except aeronautical mobile, service on a primary basis in the Frequency Allocation Table for the frequency band 3 600-3 800 MHz in Region 1, together with regulatory conditions in a footnote including the application of RR No 9.21.	C proposes alternative pfd protection limits, to include a pfd limit of [-154.5] dB (W/(m² · 4 kHz)) at 3 m above ground not to be exceeded for more than 0.005% of the time at the border of the territory. Note: This Alternative C5 was included in accordance with View 3. With regards to Method C Alternative C5, see also Views 3 and 4 before Section 1/1.3/1.
D	√	√					

Method A Justification

Method A	No Change to RR

Reason/Justification

- Sharing and compatibility studies are not convincing enough to protect incumbent services therefore upgrading the allocation to primary is not supported.

Method B Justification

Method B	Upgrade of the allocation of 3 600-3 800 MHz to the mobile, except aeronautical mobile, service on a primary basis within Region 1 without conditions

Reason/Justification

- This method proposes to upgrade the allocation of the mobile, except aeronautical mobile, service on a primary basis in the Frequency Allocation Table for the frequency band 3 600-3 800 MHz in Region 1 without any conditions.

Method C Justification

Method C	Upgrade of the allocation of 3 600-3 800 MHz to the mobile, except aeronautical mobile, service on a primary basis within Region 1 with regulatory and/or technical conditions. This Method includes five alternatives for the conditions.

Reason/Justification

- This Method contains five Alternatives. They are self-contained so if chosen by administrations when preparing proposals for WRC-23 the whole Method is clearly presented.

Method C Alternatives

Method C

Alternative C1 of Method C recognizes the need of upgrading the allocation of the frequency band 3 600-3 800 MHz to the mobile, except aeronautical mobile, service on a primary basis in Region 1, subject to agreement to be obtained under RR No. **9.21**. This Alternative proposes the same technical and regulatory conditions as for the frequency band 3 400-3 600 MHz (except IMT identification). This upgrade to be done while ensuring the protection of existing primary services. This objective could be reached by adopting the same technical and regulatory conditions applicable to the frequency band 3 400-3 600 MHz, in particular the pfd limit of -154.5 dB(W/(m² · 4 kHz)) at 3 m above ground not to be exceeded for more than 20% of time at the border.

Alternative C2 of Method C recognizes the need of upgrading the allocation of the frequency band 3 600-3 800 MHz to the mobile, except aeronautical mobile, service on a primary basis in Region 1. This upgrade to be done while ensuring the protection of existing primary services. This objective could be reached by adopting particular conditions in a footnote to the RR, in particular the pfd limit of -154.5 dB(W/(m² · 4 kHz)) at 3 m above ground not to be exceeded for more than 20% of time at the border.

Alternative C3 of Method C supports the upgrade to a mobile, except aeronautical mobile, service on a primary basis in the frequency band 3 600-3 800 MHz, or parts thereof, in Region 1, while recognising the need of the appropriate protection of the FSS at the border of each country (specifically with the implementation of a pfd limit, applicable to stations of the mobile service, of −154.5 dB(W/(m2 · 4 kHz)) at 3 m above ground not to be exceeded for more than 20% of time at the border of the territory of any other administration).

Alternative C4 of Method C proposes to upgrade the allocation of the mobile, except aeronautical mobile, service on a primary basis in the Frequency Allocation Table for the frequency band 3 600-3 800 MHz in Region 1, together with regulatory conditions in a footnote including the application of RR No **9.21**.

Alternative C5 of Method C proposes alternative pfd protection limits, to include a pfd limit of [-154.5] dB (W/(m² · 4 kHz)) at 3 m above ground not to be exceeded for more than 0.005% of the time at the border of the territory.
Note: This Alternative C5 was included in accordance with View 3.
With regards to Method C Alternative C5, see also Views 3 and 4 before Section 1/1.3/1.

Method D Justification

Method D	Upgrade of the allocation of the frequency band 3 600-3 800 MHz to the mobile, except aeronautical mobile, service on a primary basis within Region 1 without conditions, and identification for IMT.

Reason/Justification

- This Method has four views and was included in accordance with View 2.

View 1	View 2	View 3	View 4
With regards to Method D (a possible IMT identification under this Agenda Item), several administrations raised the following points, a) identification of the band, if upgraded to primary, for IMT is not in the scope of WRC-23 Agenda Item 1.3 b) there is no specific reference to identification of the band, if upgraded to primary, to IMT and the interpretation of the term "Regulatory Action" to mean identification is not supported. c) ITU-R is not eligible to interpret the language used in title of agenda item 1.3 or in its supporting Resolution d) More importantly, this method does not have any provision to protect incumbent services and their future development	Some other Administrations have the view that the framework of Resolution 246 (WRC-19) include the studies on IMT systems as part of mobile service applications as well as IMT identification within the scope of AI 1.3 considered under the purview of WP 5A. The resolution 246 (WRC-19) invites the 2023 World Radiocommunication Conference:	Some administrations are of the view that the pfd limit of -154.5 dB(W/(m² · 4 kHz)) at 3 m above ground not to be exceeded for more than 20% of time does not ensure the respect of the short-term criteria for the FSS receiver. Therefore, Method C alternative C5 proposes regulatory approach based on a pfd limit to ensure protection of the uncoordinated typical FSS earth stations. Proposed value for a limit is based on short-term protection criterion for FSS stations (I/N -1.3 dB not to be exceeded for 0.005% of time), minimal elevation angle of 5 degrees, System noise temperature of 120 K and FSS Earth station antenna Gain pattern from Rec. S.465, as provided by WP 4A.	Concerning Method C alternative C5, some administrations raised concerns regarding the applicability of the short-term criteria for the following reasons: 1) The proposed pfd limit of -154.5 dB (W/(m² · 4 kHz)) was defined for the protection of uncoordinated VSAT (for worst case scenario) and the use of such short-term criteria would lead to unrealistic protection distances 2) For large stations, for which the short-term interference criteria is important, the provision of 9.17 also applies in the coordination phase, and the coordination distance is based on the short-term interference criteria. 3) If the coordination does not apply, it is because it is not a large station and WRC-07 considered that it was not necessary to update the short-term criteria. 4) The pfd value of [-154.5 dB (W/(m² · 4 kHz))] has been previously proposed as the long-term protection threshold at 3m above ground for 20% of the time at the border of other administrations. Method C alternative C5 considers the same long-term pfd value but for 0.005% of time, which is the time % used in the short-term protection criterion. The resulting protection criterion from combining elements of both long- and short-term criteria has not been technically justified in the studies and will result in unrealistic and unnecessary separation distances.

Regional Groups Preliminary Methods for A.I 1.3

Regional Group	Method A	Method B	Method C	Method D
ATU				
CEPT				
CITEL				
RCC				
ASMG				
APT				

Thank You