

ITUEvents

3rd ITU Inter-regional Workshop on WRC-19 Preparation

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**3rd ITU INTER-REGIONAL WORKSHOP
ON WRC-19 PREPARATION
(Geneva, 4-6 September 2019)**

**Panel Session 7
ESIM (AI 1.5) & NGSO
FSS (AI 1.6) related
issues,
(plus information on
AIs 1.4, 9.1.3 and 9.1.9)**

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Chairman SG 4***

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Organized by:





Agenda Item 1.5

- **AI 1.5** - to consider the use of the frequency bands 17.7-19.7 GHz (space-to-Earth) and 27.5-29.5 GHz (Earth-to-space) by earth stations in motion communicating with geostationary space stations in the fixed-satellite service and take appropriate action, in accordance with Resolution 158 (WRC-15)
- **Resolution 158 Goals:**
 - Extend the results of Resolution 156 (for 19.7-20.2 GHz and 29.5-30 GHz) to the lower adjacent 2 GHz of FSS bands by developing a consistent approach to deployment of ESIM in the FSS to support important and growing global communication requirements
 - Enable gate-to-gate and pier-to-pier connectivity where feasible
 - Ensure, at the same time, protection of other existing services, including terrestrial services operating co-frequency and within line of sight









Agenda Item 1.5







- CPM19-2 concluded that Method B (new footnote in Art. 5 and an associated draft new Resolution specifying the technical and regulatory conditions) was the right solution for AI 1.5.
- The example text of the draft new AI 1.5 Resolution in the CPM19-2 report contained general agreement, but also had options for some of the technical and regulatory points.
- Since CPM19-2, WP 5A completed its work on a new recommendation for mobile service technical parameters, and Study Group 4 approved a new report on ESIM operation with GSO FSS satellites in the AI 1.5 bands.
- The Regional Groups have been finalizing their AI 1.5 proposals in recent weeks, and there is increasing convergence on the open items from CPM19-2.



Agenda Item 1.5 – Regional Group Approaches to Options from the CPM 19-2 Report







<p>APT, ATU, RCC subject to finalization</p>	 <p>APT</p>	 <p>ASMG</p>	 <p>ATU</p>	 <p>CEPT</p>	 <p>CITEL</p>	 <p>RCC</p>
<p>Whether the maritime/aero transmit power limits apply for protection of all co-frequency terrestrial services within the line of sight? (New Issue, Post CPM, in CITEL)</p>	<p>Maritime e.i.r.p. density applies for protection of both In country and adjacent country terrestrial services within line of sight.</p> <p>No proposal for aero</p>	<p>Maritime e.i.r.p. density and PFD mask apply for protection of both In country and adjacent country terrestrial services within line of sight</p>	<p>Maritime e.i.r.p. density and PFD mask apply for protection of adjacent country terrestrial services within line of sight</p>	<p>Maritime e.i.r.p. density and PFD mask apply for protection of both In country and adjacent country terrestrial services within line of sight</p>	<p>Maritime e.i.r.p. density and PFD mask apply for protection of adjacent-country terrestrial services in line of sight; pfd mask values can be used as guidance for administrations authorizing in-country ESIM service</p>	<p>Maritime e.i.r.p. density and PFD mask apply for protection of all terrestrial services within line of sight</p>

Agenda Item 1.5 – Addressing Options (con't)







	 APT	 ASMG	 ATU	 CEPT	 CITEL	 RCC
<p>Do transmit power limits define operating environment for all services?</p>	<p>No proposal for aero</p>	<p>Not clear</p>	<p>YES Addressed in Annex 3, first paragraph “provisions ... ensure that maritime and aeronautical ESIM do not cause unacceptable interference”</p>	<p>YES Addressed in 1.2.2: ...”deemed to not cause unacceptable interference...”</p>	<p>YES Addressed in Annex 2, first paragraph “provisions ... ensure that maritime and aeronautical ESIM do not cause unacceptable interference”</p>	<p>YES Addressed in 1.2.2: ...”deemed to not cause unacceptable interference...”</p>



Agenda Item 1.5 – Addressing Options (con't)

	 APT	 ASMG	 ATU	 CEPT	 CITEL	 RCC
ESIM transmit power level	Maritime: 70 km, 12.98 dB(W/1 MHz) Aero: No proposal	Maritime: 70 km, 12.98 dB(W/1 MHz) Aero: Adopts CEPT/ECC pfd mask (CPM option 1)	Maritime: 70 km, 24.44 dB(W/14 MHz) Aero: Adopts CEPT/ECC pfd mask (CPM option 1)	Maritime: 70 km, 24.44 dB(W/14 MHz) Aero: Adopts CEPT/ECC pfd mask (CPM option 1)	Maritime: 70 km, 12.98 dB(W/1 MHz) Aero: Adopts new mask in between CPM Option 1 and Option 2	Maritime: 70 km, 24.44 dB(W/14 MHz) Aero: Adopts CEPT/ECC pfd mask (CPM option 1)

Agenda Item 1.5 – Addressing Options (con't)

Open Issue from CPM 19-2 Report	 APT	 ASMG	 ATU	 CEPT	 CITEL	 RCC
How to address ESIM sharing with non-GSO MSS feeder links in the 29.1-29.5 GHz band	Both CPM options exist – include provision or handle vis 9.11A coordination	Handled via 9.11A coordination	Handled via 9.11A coordination	Handled via 9.11A coordination	Retains <i>resolves</i> 1.1.7, and refers to new Annex 1bis to specify that some cases are handled via 9.11A coordination and others may require additional measures	Handled via 9.11A coordination
Whether non-GSO FSS protections in Annex 1 are applied from 27.5-28.6 GHz or from 27.5-29.1 GHz	Both CPM options exist- 28.6/29.1 GHz	27.5-28.6 GHz	27.5-28.6 GHz	27.5-28.6 GHz	27.5-29.1 GHz	27.5-28.6 GHz



Agenda Item 1.6

- **AI 1.6** - to consider the development of a regulatory framework for non-GSO FSS satellite systems that may operate in the frequency bands 37.5-39.5 GHz (space-to-Earth), 39.5 42.5 GHz (space-to-Earth), 47.2-50.2 GHz (Earth-to-space) and 50.4-51.4 GHz (Earth-to-space), in accordance with Resolution **159 (WRC-15)**
- Resolution **159** Goals:
 - Develop a regulatory framework for non-GSO FSS systems that ensure compatibility with GSO satellite networks
 - Review Resolution **750(Rev WRC-15)**









Agenda Item 1.6

- CPM19-2 contains two methods. Method A proposes a regulatory framework and contains options for Resolution **750 (Rev. WRC-15)**. Method B proposes NOC.
- Method A contains an ITU-R Recommendation to be incorporated by reference, however this Recommendation was not elevated out of WP 4A.
- The Regional Groups have been finalizing their AI 1.6 proposals in recent weeks, and there is increasing convergence on the open items from CPM19-2 Method A.

Agenda Item 1.6

Regional Positions

	 APT	 ASMG	 ATU	 CEPT	 CITEL	 RCC
Non-GSO Regulatory Framework Basis	Method A	Method B	Method A	Method A	Method A	Method A
How does Non-GSO Framework Differ from CPM Report	Resolutions replaces Recommendations	N/A		Resolutions replaces Recommendations	Resolutions replaces Recommendations	TBD
Resolution 750(Rev. WRC-15)	No common proposal	Non-GSO limits only	Non-GSO limits only	Non-GSO and GSO limits	Non-GSO and GSO limits	Non-GSO and GSO limits



Agenda Item 1.4

- **1.4** to consider the results of studies in accordance with Resolution **557 (WRC-15)**, and review, and revise if necessary, the limitations mentioned in Annex **7** to Appendix **30 (Rev. WRC 15)**, while ensuring the protection of, and without imposing additional constraints on, assignments in the Plan and the List and the future development of the BSS within the Plan, and existing and planned FSS networks
- **Method A: NOC, SUP Resolution 557 (WRC-15).**
- **Method B:** Deletion of some limitations of Annex **7** and addition of draft new Resolutions **[A14-LIMITA3](WRC-19)**, **[B14-PRIORITY] (WRC-19)**, **[C14-LIMITA1A2](WRC-19)**
 - SUP: – limitation “**A1a**” and “**A2a**” accompanied by draft new Resolution **[C14-LIMITA1A2]** to address cases of certain orbital separations between new FSS networks with new BSS networks.



Agenda Item 1.4

- Method B (continued)
 - limitations “**A2b**”, “**A3b**”, and “**A3c**”;
 - limitation “A3a” accompanied by draft new Resolution [**A14-LIMITA3**] (**WRC-19**) to guarantee the protection of frequency assignments with earth station receiving antenna size smaller than 60 cm (40 cm and 45 cm), in accordance with the criteria of RR Appendix 30 (**Rev.WRC-15**).
 - NOC: limitations “**A1b**”, “**A2c**” and “**B**”.
 - ADD: Draft new Resolution [**B14-PRIORITY**] (**WRC-19**) giving priority to national assignments in the Regions 1 and 3 Plan with equivalent downlink protection margin values equal or below –10 dB.









Agenda Item 1.4

Annex 7 limitation	Region and service of interfering assign.	Region and service of impacted assignments	Frequency band, GHz	Limitation description
A1a	Region 1 BSS	Region 2 FSS (Atlantic)	11.7-12.2	No assignments in the Region 1 List further west than 37.2° W
A1b		Region 2 FSS (Pacific)		No assignments in the Region 1 List further east than 146° E
		Region 3 BSS subject to RR Appendix 30		
A2a	Region 2 BSS	Region 1 FSS (Atlantic)	12.5-12.7	No modification in the Region 2 Plan further east than 54° W
A2b		Region 1 BSS subject to RR Appendix 30	12.2-12.5	No modification in the Region 2 Plan further east than 44° W
		Region 3 FSS	12.2-12.7	No modification in the Region 2 Plan further west than 175.2° W
A2c		Region 1 BSS subject to RR Appendix 30	12.2-12.5	
		Region 1 FSS (Pacific)	12.5-12.7	
A3a	Region 1 BSS	Region 2 FSS	11.7-12.2	No assignments in the Regions 1 and 3 List outside specific allowable portions of the orbital arc between 37.2° W and 10° E
A3b				Maximum e.i.r.p. of 56 dBW for assignments in the Regions 1 and 3 List at specific allowable portions of the orbital arc between 37.2° W and 10° E
A3c				Maximum power flux-density of -138 dB(W/(m ² · 27 MHz)) at any point in Region 2 by assignments in the Regions 1 and 3 List located at 4° W and 9° E
B	Region 2 BSS	Region 2 BSS subject to RR Appendix 30	12.2-12.7	Required agreement of administrations having assignments to space stations in the same cluster when an administration may locate a satellite within this cluster



Agenda Item 1.4 – How the Regional Groups Are Addressing the Options from the CPM 19-2 Report

	 APT	 ASMG	 ATU	 CEPT	 CITEL	 RCC
CPM Method Support	Method B	Method A	Method B	Method B	Method B	Method B



Agenda Item 9.1.3

- Study of technical and operational issues and regulatory provisions for new non-geostationary-satellite orbit systems in the 3 700-4 200 MHz, 4 500-4 800 MHz, 5 925-6 425 MHz and 6 725-7 025 MHz frequency bands allocated to the fixed-satellite service.
- **No Change for all Regions**



Agenda Item 9.1 Issue 9

- **AI 9.1 Issue 9 - Resolution 162 (WRC-15)** Studies relating to spectrum needs and possible allocation of the frequency band 51.4-52.4 GHz to the fixed-satellite service (Earth-to-space)
- **Resolution 162 Goals:**
 - New primary allocations to the FSS in the frequency band 51.4-52.4 GHz (Earth-to-space) limited to FSS feeder links for geostationary orbit use, and the possible associated regulatory actions
 - Revise Resolution **750 (Rev. WRC-15)** so that passive systems in 52.6-54.25 GHz are protected.



Agenda Item 9.1 Issue 9 – How the Regional Groups Are Addressing the Options from the CPM 19-2 Report

Open Issue from CPM 19-2 Report	 APT	 ASMG	 ATU	 CEPT	 CITEL	 RCC
Allocate 51.4 to 52.4 GHz the Fixed Satellite Service for Earth-to-space gateways	Yes	Yes	Yes	Yes	Yes	Do not oppose
Resolution 750 (Rev. WRC-15)	New Limits	New Limits (May want to include a recording status of GSO EESS satellite locations)		New Limits	New Limits	New Limits as appropriate