

3rd India Spectrum Management Conference

16-17-18 October 2023, New Delhi, India

Session 12: 1:30 pm - 3:00 pm: WRC-23 and WRC-27 discussions for Satellite Agendas

Topics: WRC-23 Agenda items [1.15](#), [1.16](#), [1.17](#), 7 and 10

Topic A: What orbital tolerance would be considered acceptable when deploying and operating non-GSO systems?

Related RR provision 11.44 C, 11.49.2, 11.51, and Resolution 35 deployment milestones

notified orbital plane relating to BIU and BBIU. Defined by: altitude of apogee and perigee, the inclination of the orbital plane, and argument of perigee.

Regional Group	Regional Group Proposed Solution for AI 7 Topic A
<p>APT/ CEPT/ RCC</p> <p>Method A2A4</p>	<p>(i) orbital eccentricity less than {APT: [0.5/TBD]/ CEPT:0.5/ RCC:0.3} limited to Resolution 35 (WRC-19) systems,</p> <p>(ii) apogee altitude less than 15 000 km</p> <p>(iii) inclination tolerance of APT: [2/3] °/ CEPT: 3° for BIU then [1-3]° for operation/ RCC: 5°</p> <p>(iv) altitude tolerance of APT: [10-50]km/70 km/as narrow as practicable/ then fixed % depending on altitude, [50-75]km for BIU then [21-45]km for operation, 30 + 0.02× apogee in km</p> <p>(v) allowable exceedance for APT: [30/45] days/ CEPT: 60 days/ RCC: 90 days</p>
<p>ASMG Method A2A2:</p>	<p>(i) orbital eccentricity less than [0.5/TBD]</p> <p>(ii) apogee altitude less than 15 000 km</p> <p>(iii) altitude tolerance of [>50 and <100]km</p>
<p>ATU: (i.e. A2A1-A2A4)</p>	<p>TBD</p>
<p>CITEL Method A4</p>	<p>(i) with 2° inclination tolerance and “trigger” values of 80 and 100 km for altitude > 2000 km</p>

Topic B: Non-GSO Post Milestone Reporting : What happens if the number of satellites deployed changes over time after completion of the milestone process?"

WRC-19 : Resolution 35 which established a milestone process for deployment of non-GSO systems in specific services and frequency bands. Resolution 35 includes resolve 19 that starts to address this question and Topic B looks more carefully at the question to see if something more needs to be done.

Regional Group	Regional Group Proposed Solution for AI 7 Topic A
<p>APT/ ASMG/ CEPT/ RCC</p> <p>Method B2b</p>	<p>(i) New Resolution to replace resolves 19 of Res 35.</p> <p>Need more time to define the equations to be used</p> <p>New Resolution to replace resolves 19 of Res 35 with : $2 \leq N < N50: X = N * 75\% - 1;$</p> <p>$50 \leq N < 500: X = N * 85\% - 1; > N500 X = N * 95\% - 1$</p> <p>$N < 50: X = 0.9 \times N + 50\% ; N \geq 50: X = 95\%;$ Allow reduced number of satellites deployed for up to 3 year</p> <p>$2 \leq N < 50: X = N * 50\%; 50 \leq N < 100 X = N * 65\%; 100 \leq N < 550 X = N * 80\%; 550 \leq N < 5\ 000 X = N * 93\%; N \geq 5000 X = N * 95$</p>
<p>CITEL Method B1</p>	<p>NOC</p>
<p>ATU: (i.e. A2A1-A2A4)</p>	<p>TBD</p>

Topic C - Protection of geostationary satellite networks in the mobile-satellite service operating in the 7/8 GHz and 20/30 GHz bands from emissions of non-geostationary satellite systems operating in the same frequency bands and identical directions

- 7 250-7 750 MHz (space-to-Earth);
- 7 900-8 025 MHz (Earth-to-space);
- 20.2-21.2 GHz (space-to-Earth); and
- 30-31 GHz (Earth-to-space).

Agreed on a Preliminary APT Common Proposal to support Method C3 in the CPM Report to address this topic. In addition, the APT has formed the following views on Agenda Item 7 Topic C.

ADD: 5.A7(C)3 In the frequency band 7 375-7 750 MHz, non-geostationary-satellite systems operating in the fixed-satellite service for which complete notification information is received by the Bureau *from [16 December 2023 or the date of entry into force of the Final Acts of WRC-23]*, shall not cause unacceptable interference to and shall not claim protection from geostationary-satellite networks in the maritime mobile-satellite service operating in accordance with these Regulations. No. **5.43A** does not apply. (WRC-23)

5.461 *Additional allocation:* the frequency bands 7 250-7 375 MHz (space-to-Earth) and 7 900-8 025 MHz (Earth-to-space) are also allocated to the mobile-satellite service on a primary basis, subject to agreement obtained under No. **9.21**. However, No. 9.21 is not applicable to the geostationary-satellite networks in the mobile-satellite service with respect to non-geostationary-satellite systems for which complete coordination or notification information, as appropriate, is received by the Bureau from [16 December 2023 or the date of entry into force of the Final Acts of WRC-23]. Non-geostationary-satellite systems for which complete coordination or notification information, as appropriate, is received by the Bureau from [16 December 2023 or the date of entry into force of the Final Acts of WRC-23], shall not cause unacceptable interference to and shall not claim protection from geostationary-satellite networks in the mobile-satellite service operating in accordance with these Regulations. No. **5.43A** does not

Topic F: Ways to address the potential obstacles that can result from satellite network filings with large coverage/service areas for these cases: Excluding Uplink Service Area in R1&3 AP30A and in AP30B

- In Regions 1 and 3 Appendix 30A there is no possibility for an administration to exclude its territory from the feeder-link service area of another administration's BSS network.
- This can result in a BSS network with large uplink coverage/service area from one administration creating obstacles for another administration's BSS network filing.
- The same situation can result for Appendix 30B, even though there is a provision for an

- ✓ NO PACP was developed in APG23-6
- ✓ Any Method Except No change is possible (except F1)
- ✓ Method F2 and F3 : notifying administration of network with high receiving sensitivity (relative satellite antenna gain of at least -20 dB) over territory of other administration to accept uplink interference; and to remove right to claim protection from harmful interference,
- ✓ Method F4: to allow an administration to request the exclusion of its territory from the feeder-link service area of a satellite network of other administrations under Appendix 30A, and to include definition of feeder link coverage area in Annex 3 of Appendix 30A.

Topic H: Enhanced protection of RR AP30/30A in Regions 1 and 3 and RR AP30B : The concept of “implicit agreement” in Regions 1&3 RR AP30/30A and in AP30B has resulted in a number of cases where BSS Plan assignments and FSS allotments become effectively unusable.

- ✓ consider possible removal of the implicit agreement concept in regions 1&3 RR AP30/30A and in AP30B
- ✓ reverting to the 0.25 dB level of allowable EPM degradation for the Regions 1&3 AP30/30A BSS Plan as was the value prior to its revision at WRC-2000

Regional Group	Regional Group Proposed Solution for AI 7 Topic A
APT/ ASMG Methods H1B or H1C	Supports the proposal.
CEPT	(i) does not support changes to the current provisions but willing to consider studying the implications of suppressing provisions with regards to implicit agreement. (ii) does not support to reduce the EPM degradation tolerance in Appendices 30 and 30A without any valid technical studies
ATU:	(i) Support Method H1B option 1 (remove implicit agreement for assignment or allotments in the Plans, or those intending to enter those Plans). (ii) Support Method H2B (i.e change 0.45 to 0.25 degradation threshold)
CITEL	No view (the topic is for R1 and R3)
RCC	(i) Support Method H1D (removal of implicit agreement) (ii) Support Method H2A (NOC to EPM degradation) due to difficulties of re-notifying additional

Agenda Items for WRC 23

No.	Summary	APT	ASMG	ATU	CEPT	CITEL	RCC
2.1	New RL allocations in 231.5 - 275 GHz	✓			✓		
2.2	Aeronautical and maritime GSO ESIM			✓	✓		✓
2.3	FSS allocation in [43.5-45.5 GHz]	✓			X		
2.4	Determining pfd and eirp limits in Article 21 for 71-76 and 81-86 GHz	✓			✓		✓
2.5	Compatibility of satellite services with passive services in 71-76 GHz and 81-86 GHz	✓			Replac e		✓
2.6	Space weather sensors	✓			✓	✓	✓
2.7	Non-GSO feeder link in 71-76 GHz and 81-86 GHz	X					
2.8	Non-GSO space link in 1.5/1.6 GHz	X			✓	✓	
2.9	New MS allocation in 1300 -1350 MHz	X	X	X	X	X	X
2.10	VHF maritime frequencies in Appendix 18	✓			✓	✓	X
2.11	New EESS allocation in 22.55-23.15 GHz	✓			✓	✓	✓
2.12	Removal except aero mobile in 694-960 MHz	✓			✓		✓

APT New proposals FOR WRC-27 Agenda items

Issue 1: New FSS/BSS allocations (Region 3) in 17.3-17.7 GHz

Issue 2: MSS allocations below 4 GHz

Issue 3: FSS in the 13.75-14 GHz band

Thank you.