Doordarshan's Perspective on WRC-12

Rajeev Kumar

Deputy Director (Engineering)

Doordarshan (DDI)

Broadcasting Issues - WRC-12 Agenda Items

Agenda Item	Description of Agenda item
1.5 **ENG**	to consider worldwide/regional harmonization of spectrum for electronic news gathering (ENG), taking into account the results of ITU-R studies, in accordance with Resolution **954 [COM6/5] (WRC-07)**;
1.13 **BSS**	to consider the results of ITU-R studies in accordance with Resolution **551 [COM6/13] (WRC-07)** and decide on the spectrum usage of the 21.4-22 GHz band for the broadcasting-satellite service and the associated feeder-link bands in Regions 1 and 3;
1.14 **RLS**	to consider requirements for new applications in the radiolocation service and review allocations or regulatory provisions for implementation of the radiolocation service in the range 30-300 MHz, in accordance with Resolution **611 [COM6/14] (WRC-07)**;
1.17 **JTG5.6**	to consider results of sharing studies between the mobile service and other services in the band 790-862 MHz in Regions 1 and 3, in accordance with Resolution **749 [COM4/13] (WRC-07)**, to ensure the adequate protection of services to which this frequency band is allocated, and take appropriate action;
1.19 **CRS & SDR**	to consider regulatory measures and their relevance, in order to enable the introduction of software-defined radio and cognitive radio systems, based on the results of ITU-R studies, in accordance with Resolution **956 [COM6/18] (WRC-07)**;
1.20 **HAPS**	to consider the results of ITU-R studies and spectrum identification for gateway links for high altitude platform stations (HAPS) in the range 5 850-7 075 MHz in order to support operations in the fixed and mobile services, in accordance with Resolution **734 (Rev.WRC-07)**;
1.22 **SRD**	to examine the effect of emissions from short-range devices on radiocommunication services, in accordance with Resolution **953 [COM6/4] (WRC-07)**;
1.25 **MSS**	to consider possible additional allocations to the mobile-satellite service, in accordance with Resolution 231 (WRC-07);
8.2 **Next WRC Agenda**	to recommend to the Council items for inclusion in the agenda for the next WRC, and to give its views on the preliminary agenda for the subsequent conference and on possible agenda items for future conferences, taking into account Resolution **806 [COM6/22] (WRC-07)**,

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*To consider worldwide/regional harmonization of spectrum for electronic news gathering (ENG), taking into account the results of ITU-R studies, in accordance with Resolution **954 (WRC-07)**;*

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- Four methods: method A, B, C & D
- can be categorized into three groups
  - rationalization of the spectrum used by ENG. Method A targets this objective
  - harmonization of tuning ranges within frequency bands for ENG. Methods B and C target this goal
    - they differ in their regulatory implementation and their potential effect towards harmonization.
  - combination of both: Method D

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Method A

Proposes a WRC Resolution encouraging the development of a database of frequencies used in each country for ENG;

- Can provide broadcasters with information on the spectrum used for ENG usage in each country
  - thereby facilitating identification and access to frequencies for coverage of international news events.
- This method encourages regulators and manufacturers to work toward equipment standardization.

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Disadvantages

- The development, population, maintenance and verification of the accuracy of a database will require extensive time and effort on an ongoing basis.
- It may be difficult to identify the responsible body for the data base and to clearly mark responsibilities and roles.

Method A: Regulatory Measures

- **NOC** RR Article 5.
- **ADD** RESOLUTION [A105-ENG-METHA]

  Spectrum Management guidelines for ENG
- **SUP** Res. 954

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Method B

proposes to include in a WRC Recommendation/ Resolution a list of frequency bands for harmonization of tuning ranges for ENG use to the extent achievable on a regional/worldwide basis.

- provides worldwide/regional harmonization of frequency bands/tuning ranges for ENG.
- may encourage others to deploy and develop ENG systems in the harmonized tuning ranges/frequency bands.
- may provide stability for both administrations and manufacturers as it can only be modified and/or complemented by a future WRC.

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Disadvantages

- it may be difficult to address amendments arising from technology advancement given the ability to amend these only at a WRC.
- Deployment of ENG systems in a limited number of frequency bands may lead to increased congestion.
- Studies for the potential tuning ranges/frequency bands proposed for ENG harmonization may not be available in time for consideration at WRC-12.

Method B: Regulatory Measures

- **NOC** RR Article 5.
- **ADD** REC/RESOLUTION [B105-ENG-METHB]

  Tuning ranges for worldwide/regional harmonization for ENG
- **SUP** Res. 954

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Method C

Development and approval of ITU-R Recommendations and/or Reports listing preferred frequency bands and tuning ranges for ENG applications preferably on a regional or worldwide basis.

- This method would not require any action at WRC-12.
- May provide some level of worldwide / regional harmonization for frequency bands/tuning ranges for ENG applications.
- Allows the ITU-R to continue studying this issue outside of the constraints of the WRC schedule.

Disadvantages

- Relies upon administrations to monitor and maintain any ITU-R Recommendation(s) listing preferred frequency bands and tuning ranges for ENG applications.
- May not achieve rationalization/harmonization of tuning ranges and frequency bands assigned by administrations for ENG.
- Less stability and /or consistency in the tuning ranges and frequency bands to give manufacturers and regulators confidence to adopt the recommended frequencies for ENG.

Method C: Regulatory Measures

- **NOC** Volumes 1, 2, 3 and 4 of the Radio Regulations.

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Method D

i. **Development of a WRC Recommendation with a list of frequency bands/tuning ranges for ENG intended for harmonization to the extent possible.**

ii. **Proposes a WRC Resolution intended to encourage the development of a database of frequency bands which may be available for cross-border deployment in each country for ENG and other relevant information.**

- Provides worldwide/regional harmonization of tuning ranges for ENG,
- Provide stability for both administrations and manufacturer as tuning ranges can be modified by a future WRC,
- Provides information on the spectrum available and the regulatory process to gain access to spectrum for ENG usage in each country
- Associated database can be used for equipment standardization.

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Disadvantages

- it may be difficult to address amendments arising from technology advancement given the ability to amend these only at a WRC.
- Deployment of ENG systems in a limited number of frequency bands may lead to increased congestion.
- Studies for the potential tuning ranges/frequency bands proposed for ENG harmonization may not be available in time for consideration at WRC-12.
- The development, population, maintenance and verification of the accuracy of a database will require extensive time and effort on an ongoing basis.

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Method D: Regulatory Measures

- **NOC** RR Article 5.
- **SUP** Res. 954
- **ADD** RECOMMENDATION [TUNING RANGES]

  Tuning ranges for worldwide/regional harmonization for ENG
- **ADD** RESOLUTION [DATABASE]

  Frequency information and condition for ENG

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APT Views

APT Members support the harmonization of frequencies for ENG and the related studies being undertaken by the ITU-R on this issue. No consensus was arrived at during APG12-5 and various members proposed different methods (A, B, C &D) to be supported. However, majority was of the view to support Method C.

Also by CEPT & RCC.

USA & CITEL: Method A

ATU: Method D

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to consider the results of sharing studies between the mobile service and other services in the band 790-862 MHz in Regions 1 and 3, in accordance with Resolution 749 (WRC-07), to ensure the adequate protection of services to which the frequency band is allocated, and take appropriate actions

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Background

- At WRC-07, the band of 790-862MHz was allocated to the mobile service on a primary basis for Region 1
- the mobile service in the band of 698-806MHz was upgraded to a primary service from secondary service for Region 2
- there was no change of frequency allocation of the services in the band for Region 3
- The services currently allocated in the frequency band 790-862 MHz in Regions 1 and 3 are the BS, FS and MS

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Three identified issues:

(corresponding to three different sharing pairs with the MS)

- Issue A: BS (Broadcasting Service)
- Issue B: ARNS (Aeronautical Radio Navigation Service)
- Issue C: FS (Fixed Service)

Issues A is further divided into three parts:

- In countries Contracting Members to the GE06
- In countries Non-Contracting Members to the GE06
- Between countries Contracting Members and Non-Contracting Members to the GE06 Agreement

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- Issues and Methods identified in CPM report is given below:

Issue	Method	Countries	Descriptions	Regulatory considerations
BS	A1	GE06 countries	Option I: NOC	-
			Option II: optional arrangements	MOD Res. **749**
			Option III: mandatory arrangements	
	A2	Non-GE06 countries	NOC	-
	A3	Between GE06 and non-GE06 countries	Option I: NOC	
			Option II: additional arrangement	ADD Rec.**[JTG 5-6]**
ARNS	B1	Region 1 countries	Inclusion of coordination distance or field strengths threshold B1bis: B1 with seeking agreement procedure	MOD Res. **749**
	B2		Deactivation of RR No.**9.21** in RR No.**5.316B** B2bis: Constraint to MS if not applied RR No.**9.21**	ADD Res.**[MOBILE/ARNS]**
				ADD **5.A117** MOD Res. **749**
	B3	Between Regions 1 and 3 countries	Option I: NOC	-
			Option II: additional arrangement	ADD Rec.**[JTG 5-6]**
FS	C	All countries	Option I: NOC	-
			Option II: additional arrangement	ADD Rec.**[JTG 5-6]**

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Issue	Method	Countries	Descriptions	Regulatory considerations
BS	A1	GE06 countries	Option I: NOC	-
			Option II: optional arrangements	MOD Res. **749**
			Option III: mandatory arrangements	
	A2	**Non-GE06 countries**	**NOC**	**-**
	A3	Between GE06 and non-GE06 countries	Option I: NOC	
			Option II: additional arrangement	ADD Rec.**[JTG 5-6]**

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APT Views

- APT Members support the methods A2, A3 (option I), B3 (option I), C(option I).
- There is no need to change the current provisions in RR in force under this agenda item except the revision of Resolution 749 making it only for GE06 countries A1(option III).

NPC has decided to provide its own input to WRC-12.

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to consider the results of ITU-R studies in accordance with Resolution 551 (WRC-07) and decide on the spectrum usage of the 21.4-22 GHz band for the broadcasting-satellite service and the associated feeder-link bands in Regions 1 and 3;

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- The 21.4-22.0 GHz band recognized as one of the most favourable frequency bands for **advanced digital satellite broadcasting applications** as they require larger bandwidth capacity
- Those applications include:
  - UHDTV (Ultra High Definition Television)
  - 3DTV (Three Dimensional Television)
  - VIS (Digital Multimedia Video Information System)
  - Multi-channel HDTV
  - LSDI (Large Screen Digital Imagery)
  - EHRI (Extremely High Resolution Imagery)

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three main issues:

Issue A: Regulatory mechanisms for the use of the BSS in the frequency band 21.4-22 GHz (intra-service issues).

Issue B: The need or otherwise to allocate specific frequency band(s) for feeder links of the BSS in Regions 1 and 3 (feeder-link issues).

Issue C: Regulatory mechanisms for the protection of/sharing between BSS in Regions 1 and 3, on the one hand, and terrestrial services in Regions 1 and 3 as well as those of Region 2, on the other hand (inter-service issues).

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Issue A

- eight methods are proposed.
- These methods have one main commonality in that they all propose that the regulatory mechanism currently in force, i.e. procedures contained in RR Articles **9**, **11** and **23** be applied for the use of the above-mentioned frequency band (concept/principle of first-come first-served) (Method A).
- However, Methods B to H propose additional measures with a view to enhance the equitable access to the orbit and spectrum resources in this band.

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Issue B

- Two methods were proposed:

a) allocation of the band 24.65-25.25 GHz in Region 1 and of the band 24.65-24.75 in Region 3 for feeder links for the BSS (21.4-22 GHz),

b) no allocation for the feeder link for the BSS (21.4-22 GHz).

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Issue C: Divided in two parts

- for the sharing between terrestrial services in Regions 1 & 3 and BSS in Regions 1 & 3

- for the sharing between terrestrial services in Region 2 and BSS in Regions 1 & 3

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*To consider possible additional allocations to the mobile-satellite service, in accordance with Resolution **231 (WRC-07)**;*

Resolution **231 (WRC-07)**: *Additional allocations to the mobile-satellite service with particular focus on the bands between 4 GHz and 16 GHz.*

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1) *to establish technical characteristics of new MSS systems that might operate in the frequency range in question;*
2) *to evaluate the spectrum requirements for new MSS applications;*
3) *sharing studies with other services.*

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Estimated spectrum needs by 2020 in the 4-16 GHz range*

	Low/baseline scenario	High traffic scenario
Estimated spectrum needs in the Earth-to-space direction (as contiguous as possible)	240 MHz	335 MHz
Estimated spectrum needs in the space-to-Earth direction (as contiguous as possible)	240 MHz	335 MHz

*There is a need for further studies on the bandwidths for the estimated spectrum needs.

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Potential frequency bands for new MSS allocations

Frequency band	MSS direction (DL = downlink, UL = uplink)
5 150-5 250 MHz	DL
7 055-7 250 MHz	DL
8 400-8 500 MHz	UL
10.5-10.6 GHz	DL
13.25-13.4 GHz	DL
15.43-15.63 GHz	UL

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Frequency band	Existing radio services in the band
5 150-5 250 MHz	ARNS, FSS, RLAN, AMT
7 055-7 250 MHz	FS, BAS, MS, FSS, EESS, SOS, SRS
8 400-8 500 MHz	SRS, FS
10.5-10.6 GHz	FS, BAS, RLS, EESS, SRS, RAS
13.25-13.4 GHz	ARNS
15.43-15.63 GHz	ARNS, FSS, RLS, RAS

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7055 – 7250 MHz : Broadcasting Auxiliary Services

- *The band used by broadcasting auxiliary services (BAS), which operate as part of the FS or MS.*
- *Protection of BAS receivers: Pfd limits or thresholds would be required*
  - One potential mask proposed is –158 dBW/m^2/MHz (angles below 3°), rising to –124 dBW/m^2/MHz (for angles above 25°).
  - An alternative pfd mask which is being studied is between –140 dBW/m^2/MHz (angles below 5°) rising to −115 dBW/m^2/MHz for angles above 20°.
  - Studies of the necessary pfd values need to be completed.

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7055 – 7250 MHz : Broadcasting Auxiliary Services

- *Protection of MES from BAS transmitters: Separation distance would be required*
  - Using some assumptions (including non worst case alignment of antennas, no clutter loss), separation distances are in the range of a few km to about 40 km in the worst case.
  - Some administrations have the view that the assumptions are too optimistic and the calculated separation distances may exceed 100 km.

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- Several administrations expressed the view that sharing between incumbent services and new MSS applications would practically not be feasible in the frequency bands 7055-7250 MHz and 8400-8500 MHz due to severe operational constraints that MSS systems may suffer to achieve compatibility with affected services.
- Therefore, these frequency bands should not be identified for MSS.

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India View

- Indian administration is of the view that there should not be any allocation for MSS, i.e., No Change to RR.
- Method A1, B1, C1, D1, E1, F1 to be supported.

    - PACP also supports No Change to RR.

Thank You