

Draft Brief Agenda Item 1.11

Agenda item 1.11: to review sharing criteria and regulatory provisions for protection of terrestrial services, in particular terrestrial television broadcasting services, in the band 620-790 MHz from BSS networks and systems, in accordance with Resolution 545 (WRC-03)

Issue

To develop sharing criteria and regulatory provisions, prior to WRC-07, for the protection of terrestrial services, in particular terrestrial television broadcasting services, in the 620-790 MHz band from GSO BSS networks and non-GSO BSS satellite networks or systems.

Preliminary CEPT position

CEPT is considering both Method A1 and Method B and has not decided on the way forward.

It is necessary to protect existing and future terrestrial services including the terrestrial television broadcasting in this band. In particular, it is necessary to effectively protect the broadcasting Plans adopted by the RRC-06 and their subsequent evolution from the GSO-BSS and/or non-GSO BSS networks/systems which were not brought into use prior to 5 July 2003.

As a general principle, Broadcasting Satellite Service in this band shall not claim protection from existing and future terrestrial services. In particular, appropriate and necessary measures should be taken in order that the ground terminals of GSO and/or non-GSO BSS networks/systems which were not brought into use prior to 5 July 2003 shall not claim protection from the Plans adopted by the RRC-06 and their subsequent evolution, nor put any constraint on the operation of the assignments of the Plans and their subsequent evolution.

Background¹

WRC-03, under agenda item 1.37, reviewed the sharing situation as prescribed in No. 5.311 of the RR. Some problems with the sharing criteria and the existing provisions related to the band 620-790 MHz have been identified. As a consequence, Resolution 545 (WRC-03) was developed.

This Resolution has suspended the processing of existing and future submissions of GSO and non-GSO BSS networks or systems in the band 620-790 MHz as well as the bringing into use in this frequency band of GSO and non-GSO satellite networks or systems other than those notified, brought into use and the date of bringing into use confirmed before the end of WRC-03, pending the conclusions of WRC-07 on adequate provisions to protect terrestrial services.

To resolve the problem, the same Resolution requests ITU-R to develop sharing criteria and regulatory provisions, prior to WRC-07, for the protection of terrestrial services, in particular terrestrial television broadcasting services, in the 620-790 MHz band from GSO BSS networks and non-GSO BSS satellite networks or systems.

¹ The background has not been updated at CPG07-8.

WP 6E is the leading group for this item. A report on the protection of terrestrial broadcasting from BSS transmissions has been prepared in this group and this report has been finally adopted as report BT.2075 by SG6 at its September 06 meeting.

The protection of the radio astronomy in 608-614 MHz from unwanted emissions of BSS operating in the 620-790 MHz band is addressed by TG1/9 under WRC-07 AI 1.21.

A lot of work has been performed to study the protection of terrestrial radio systems from BSS. For CEPT the protection of the terrestrial broadcasting service (BS) and the aeronautical radio navigation service (ARNS) are most important as these services have primary allocations in Region 1 in the frequency band 620-790 MHz.

Summary of technical studies

1) for the protection of the aeronautical radio navigation service

WP 8B has developed values for the maximum interfering power-flux densities for the protection of the more sensitive aeronautical radio navigation system in the band 645-862 MHz from the broadcasting satellite service operating in the band 620-790 MHz. According to the result of these studies the maximum allowable value for the power-flux density of a BSS space station is:

$$\begin{aligned}
 -137 \text{ dBW/m}^2/\text{MHz} &= -161 \text{ dBW/m}^2/4 \text{ kHz} && \text{for angles of arrival below } 60^\circ \\
 -135.75 \text{ dBW/m}^2/\text{MHz} &= -159.75 \text{ dBW/m}^2/4 \text{ kHz} && \text{for angles of arrival between } 60^\circ \\
 &&& \text{and } 90^\circ \text{ and circularly polarized BSS signals}
 \end{aligned}$$

However, it has been noted that some BSS satellite (“Stationar”) are already operating with pfd levels significantly higher (-121 dBW/m²/MHz) over countries where such radionavigation services are operating. The sharing is based on ensuring that the operation of the BSS system will not be at frequencies used for these sensitive aeronautical systems.

These kind of sharing agreement can be reached based on coordination under article 9.11.

2) for the protection of the broadcasting service

ITU-R Report BT. 2075 provides the following results:

TABLE 1

Summary of calculated maximum interfering single entry power flux-density

BS system to be protected from BSS	Max. interfering pfd (dBW/m ² /MHz) d ≤ 20°+x° Note 1	Max. interfering pfd (dBW/m ² /MHz) d ≥ 60°+x° Note 1
Analog television service – nominal	-142	-127

coverage area (fixed reception)		
Analog television service – fringe coverage area (fixed reception)	-148	-133
Digital System B (DVB-T) (fixed reception)	-137	-122
Digital System B (DVB-T) (portable outdoor reception)	-130	-130
Digital System B (DVB-T) (portable indoor reception)	-122	-122
Digital System B (DVB-T) (mobile reception)	-130	-130

NOTE 1 – The factor x° is indicated here as a reminder that the receiving antenna discrimination is obtained using directly Recommendation ITU-R BT.419., hence assuming a typical tilt angle of 0° for these antennas. Investigations have shown that this assumption does not remain valid in hilly environments. Appendix 2 concludes that a representative average tilt angle $x^\circ = 10^\circ$ can be used although some Administrations stated that a representative tilt angle of $x = 15^\circ$ or some other value may be more appropriate to cover this phenomenon.

It should be noted that the results of the report have been derived assuming that the BSS uses digital transmissions and circular polarisation and operates with elevation angles in the BSS coverage areas above 60° only.

Two methods have been included in the CPM text :

- Method A proposes modifications to No. **5.311 (WRC-03)** and modifications to Resolution **545 (WRC-03)** to bring Resolution **545 (WRC-03)** up to date and to specify how BSS filings will be processed in the future. Method A is split into two options whereby Method A1 stipulates a hard limit mask deemed by some administrations as sufficient to protect the terrestrial services and Method A2 requires a seeking of agreement procedure on the satellite filing administration as an alternative way to ensure the protection of the terrestrial services.
- Method B proposes suppression of No. **5.311 (WRC-03)** and development of a Draft New Resolution **[620-790MHz] (WRC-07)**.

List of relevant documents

Resolution 545 (WRC-03)
Document 6E/366
ITU-R Report BT.2075
RRC-06 RES COM 5/1

Actions to be taken

See the report from CPG07-8.

Proposals from outside CEPT

Regional telecommunication organisations

APT (January 2007)

APT Preliminary View

While one APT administration is of the opinion that Method A as modified could satisfy the Agenda Item except for the protection of terrestrial services other than broadcasting for which there are no values for pfd, other APT members support Method B as modified which properly satisfies the existing operation and future development of the terrestrial systems, in particular television broadcasting, including digital systems.

CITEL (October 2006)

Inter-American proposal supported by Costa Rica, Dominican Republic, Guatemala, Paraguay, Peru and Uruguay

NOC

Article 5, Article 9 or Article 21 of the ITU RR

Draft Inter-American proposal supported by Canada, Brazil and US

Suppress BSS allocation in the 620-790 MHz band while allowing existing system to continue to operate (i.e., CPM-Method B)

Reason

Region 2 administrations have no plans to implement BSS systems in the band 620-790 MHz. The administrations in Region 2 are currently operating or planning to operate a large number of terrestrial analog and digital television broadcasting systems. In addition, some Region 2 administrations will be implementing mobile and fixed services, including public safety applications. As a result of this extensive use of the 620-720MHz by existing systems, Region 2 Administrations have not allocated any additional interference margins for the protection of terrestrial TV broadcasting and therefore any additional interference from BSS will place undue constraints on the existing and planned services in Region 2.

RCC

Preliminary views (September 2006):

The 620-790 MHz frequency band is subject of the Regional Radiocommunications Conference Agreement 2006 (RRC-06). In this line the WRC-07 decisions shall take into account the provisions of this Agreement including technical and regulatory aspects of the usage of systems of services other than broadcasting.

The RCC Administrations consider it is necessary to take at the WRC-07 the appropriate measures on ensuring the effective protection of the Plans adopted by the RRC-06 as well as other primary terrestrial services which are subject of this Agreement from GSO BSS

networks/systems and /or non-GSO BSS networks/systems which had not been bring into use before 05.07.2003;

The RCC Administrations consider it necessary to take at the WRC-07 the appropriate measures in order the terrestrial terminals of GSO BSS networks/systems and/or non-GSO BSS networks/ systems which had not been bring into use before 05.07.2003 should not require protection from the Plans adopted at the RRC-06 and also the other primary terrestrial services which are subject of this Agreement and should not impose any constraints on the use of the assignments of the Plans and other primary terrestrial services.

The PFD values stipulated in the item RR No. **5.311** (-129 dBW/m^2 in the 8 MHz band for the angles of arrival no less than 20 degrees) are sufficient to protect analogue and digital television.

To protect the ARNS systems operating in accordance with item RR No. **5.312** the PFD restriction of broadcasting satellites to the -161 dBW/m^2 level in the 4 kHz band is required for all angles of arrival.

International organisations

NATO (February 2007)

NATO Military Position

The current allocation providing options for the use of military systems in this band should be retained.