## UNITED STATES OF AMERICA

## **DRAFT PRELIMINARY VIEWS FOR WRC-15**

**Agenda Item 7**: to consider possible changes, and other options, in response to Resolution 86 (rev. Marrakesh, 2002) of the Plenipotentiary Conference, an advance publication, coordination, notification and recording procedures for frequency assignments pertaining to satellite networks, in accordance with Resolution **86** (**Rev. WRC-07**) to facilitate rational efficient, and economical use of radio frequencies and any associated orbits, including the geostationary – satellite orbit

**ISSUE:** Considering whether the orbital position limitations found in Appendix 30 to the Radio Regulations are still relevant to ensure equitable access to the orbital/spectrum resource between the Regions

**BACKGROUND**: There are existing provisions in the Radio Regulations addressing interregional sharing criteria between the fixed-satellite service (FSS) and the broadcasting-satellite service (BSS) in the 11.7-12.7 GHz bands where FSS (or unplanned BSS) serves one Region and planned BSS serves another Region using shared portions of the orbital arc in the same frequency band. Working Party 4A has initiated a review of the expanded use of the orbital arc since the last WRC that updated these provisions.

Appendix 30 to the Radio Regulations has detailed provisions and associated coordination triggers both for modifications to the Plans and/or List. In particular, the relevant provisions and associated technical criteria are:

- Article 4 of Appendix 30 → procedure for proposed modifications to the BSS Plan or List to coordinate with unplanned FSS or BSS
- Article 7 of Appendix 30 → procedure for unplanned BSS or FSS networks to coordinate with BSS Plan or List assignments or previously filed modifications to the Plan or List
- Annex 1 to Appendix 30 → criteria to determine if a proposed modification to the BSS Plan or List needs to coordinate with unplanned FSS or BSS networks
  - o The criteria here is a power-flux density (pfd) mask.
- Annex 4 to Appendix 30 → criteria to determine if an unplanned FSS or BSS network needs to coordinate with the BSS Plan or List assignments or previously filed modifications to the Plan or List
  - o The crtieria here is a pfd mask.
- Annex 6 to Appendix 30 → summary of the assumptions used to develop the power flux density (pfd) levels contained in Annexes 1 and 4 to Appendix 30

• Annex 7 to Appendix 30 → orbital position limitations on modifications to the BSS Plan or List; specifically applicable to Region 2 BSS in 12.2-12.7 GHz and to Region 1 BSS in 11.7-12.2 GHz. Annex 7 also contains associated EIRP limits for Region 1 BSS in a portion of the arc.

Annex 6 is particularly useful in understanding the derivation of the Annex 1 and 4 pfd limits, with respect to the earth stations considered and the desired  $\Delta T/T$  value.

The following Recommendations and Reports are also relevant:

- Recommendation ITU-R BO.1697, "Power flux-density values in the band 11.7-12.7 GHz and associated calculation methodology which may be used for bilateral coordination when the power flux-density values in § 3 of Annex 1 to Appendix 30 or Annex 4 to Appendix 30 of the Radio Regulations are exceeded ", adopted in 2005. This Recommendation further expands upon the information in Annex 6 to Appendix 30, and generally breaks down the pfd levels in Annexes 1 and 4 for inter-regional sharing by wanted earth station size.
- Report ITU-R BO.809, "Inter-regional sharing of the 11.7 to 12.75 GHz frequency band between the broadcasting-satellite service and the fixed-satellite service", adopted in 1990. While this Report is over 20 years old, it does note that the inhomogenous nature of FSS and BSS makes sharing more difficult.

In particular, it is interesting to consider the relationship between Annexes 1, 4, 6 and 7, and to assess the factors that may have driven adoption of those provisions as well as noting factors that may have changed since WRC-03.

Some comments on the relationship between Annexes 1, 4, 6 and 7 of Appendix 30:

- Section 1 of Annex 1 to Appendix 30 includes a hard limit of -103.6 dBW/m<sup>2</sup>/27 MHz for additional assignments in the Regions 1 and 3 BSS List. This is equivalent to roughly a peak EIRP of 58.5 dBW/27 MHz.
- Similarly, the highest operating power flux density (pfd) level without triggering coordination of FSS in any Region vis a vis BSS under Annex 4 to Appendix 30 (or, for BSS vis a vis seeking agreement with FSS in Section 6 of Annex 1 to Appendix 30) is also -103.6 dBW/m<sup>2</sup>/27 MHz.
- Annex 7 allows use of certain orbital positions by Regions 1 and 3 BSS List assignments in the shared part of the arc between Regions 1 and 2 if the BSS peak EIRP level does not exceed 56 dBW/27 MHz, which is several dB lower than that in Section 1/Annex 1 and Annex 4.
- Different minimum and maximum earth station sizes for FSS and BSS (see Annex 6) led to different mask for protecting each service.
  - o For close orbital separations, larger earth station antennas could lead to more stringent allowed pfd levels

o For larger orbital separations, smaller earth station antennas could lead to more stringent allowed pfd levels

Other factors that likely related to development of the sharing criteria:

- Different expected operating EIRP levels for FSS and BSS
  - o Larger discrepancies could lead to more interference to FSS and larger orbital separations needed.
- Difference in coverage areas and associated beam roll off between networks serving the different regions
  - o Greater geographic separation facilitates sharing, which could at least be taken into account between Regions 1 and 2.

Working Party 4A is currently assessing the above considerations.

## U.S. VIEW:

The United States supports studies to evaluate the orbital position limitations contained in Annex 7 to Appendix 30 of the Radio Regulations, with a view to to evaluate actual use since WRC-03 of the shared orbital arc resource, and to identify any new trends as more satellite networks have been implemented and planned in the shared part of the orbital arc, for example, between Regions 1 and 2 that could lead to some potential relaxation to those orbital position limitations.