

RECOMMENDATION ITU-R BO.1517

Equivalent power flux-density limits, $epfd_{\downarrow}$, to protect the broadcasting-satellite service in the 12 GHz band from interference caused by non-geostationary fixed-satellite service systems

(Resolution 76 (WRC-2000))

(2001)

The ITU Radiocommunication Assembly,

considering

- a) that the bands 11.7-12.5 GHz in Region 1, 12.2-12.7 GHz in Region 2 and 11.7-12.2 GHz and 12.5-12.75 GHz in Region 3 are allocated to the broadcasting-satellite service (BSS);
- b) that the World Radiocommunication Conference (Geneva, 1997) (WRC-97) allocated the bands listed in *considering* a) to the non-geostationary fixed-satellite service (non-GSO FSS) (space-to-Earth) subject to the provisions of Resolution 538 (WRC-97);
- c) that emissions from the stations of non-GSO FSS satellite systems may result in interference to BSS networks and associated feeder links when these networks operate in the same frequency bands;
- d) that No. 22.2 of the Radio Regulations (RR) states that non-GSO satellite systems shall not cause unacceptable interference to GSO satellite systems in the FSS and BSS operating in accordance with these Regulations;
- e) that, in the bands listed in *considering* a), WRC-97 adopted the concept of single-entry $epfd_{\downarrow}$ to quantify the level of interference from non-GSO FSS systems to protect GSO BSS systems and also adopted provisional values for $epfd_{\downarrow}$;
- f) that, in the bands listed in *considering* a), the World Radiocommunication Conference (Istanbul, 2000) (WRC-2000) adopted single-entry $epfd_{\downarrow}$ limits (see RR Article 22) that each non-GSO FSS system must meet;
- g) that in the bands listed in *considering* a), WRC-2000 also adopted aggregate $epfd_{\downarrow}$ limits (see Resolution 76 (WRC-2000) and No. 22.5K of RR Article 22) that the combined interference from the non-GSO FSS systems operating in the band must meet in order to satisfy the criteria of Recommendation ITU-R BO.1444 for protection of GSO BSS networks,

further considering

- h) that ITU-R has developed a methodology to assess the impact of the aggregate interference from all non-GSO FSS systems to GSO satellite systems in the FSS and BSS;
- j) that ITU-R has developed criteria to protect GSO satellite systems in the BSS operating in accordance with the RR from the aggregate interference caused by all non-GSO FSS systems;
- k) that such a methodology and criteria are contained in Recommendation ITU-R BO.1444;
- l) that the $\text{epfd}_{\downarrow}$ limits applicable to non-GSO FSS systems in the frequency bands listed in *considering a)* are single-entry limits;
- m) that there is a need to relate the level of interference caused by a single non-GSO FSS system to that caused by multiple systems into GSO BSS networks;
- n) that studies have concluded that the interference power from multiple non-GSO FSS systems aggregates in a certain manner (as shown in Annex 2);
- o) that ITU-R has defined the equivalent number, $N_{\text{effective}}$ (equal to 3.5) of systems to be considered for the purposes of studying the impact of aggregate interference from multiple non-GSO FSS systems operating in the bands listed in *considering a)*, under the assumption that each system operates at the single-entry $\text{epfd}_{\downarrow}$ limits,

recommends

- 1 that, consistent with Resolution 76 (WRC-2000), the specific aggregate $\text{epfd}_{\downarrow}$ limits of Annex 1 are appropriate to protect GSO BSS from non-GSO FSS interference;
- 2 that, in designing GSO BSS networks, administrations should take into account aggregate interference from non-GSO FSS systems produced at the levels in Annex 1 using the methodology and criteria contained in Recommendation ITU-R BO.1444;
- 3 that, the methodology described in Annex 2 should be used to derive single-entry $\text{epfd}_{\downarrow}$ values from aggregate $\text{epfd}_{\downarrow}$ values and vice versa (see Note 3).

NOTE 1 – The $\text{epfd}_{\downarrow}$ values described in Annex 1 are based on reference BSS earth station antenna patterns found in Recommendation ITU-R BO.1443.

NOTE 2 – The single-entry $\text{epfd}_{\downarrow}$ values provided in Appendix 1 to Annex 2 have been derived from the aggregate $\text{epfd}_{\downarrow}$ values in Annex 1 using the methodology described in Annex 2 and taking into account *further considering o)*. Appendix 1 to Annex 2 is provided for information purposes.

NOTE 3 – This methodology was developed by Radiocommunication Study Group 4.

ANNEX 1

Aggregate $\text{epfd}_{\downarrow}$ limits to protect GSO BSS systems from non-GSO FSS interference

TABLE 1^{*,**}

Limits on aggregate $\text{epfd}_{\downarrow}$ radiated by non-GSO FSS systems in certain frequency bands for 30 cm, 45 cm, 60 cm, 90 cm, 120 cm, 180 cm, 240 cm and 300 cm BSS antennas

Frequency band (GHz)	$\text{epfd}_{\downarrow}$ (dB(W/m ²))	Percentage of time during which $\text{epfd}_{\downarrow}$ level may not be exceeded	Reference bandwidth (kHz)	Reference antenna diameter, and reference radiation pattern ⁽¹⁾
11.7-12.5 in Region 1 11.7-12.2 and 12.5-12.75 in Region 3 12.2-12.7 in Region 2	-160.4	0	40	30 cm Recommendation ITU-R BO.1443, Annex 1
	-160.1	25		
	-158.6	96		
	-158.6	98		
	-158.33	98		
	-158.33	100		
	-170	0	40	45 cm Recommendation ITU-R BO.1443, Annex 1
	-167	66		
	-164	97.75		
	-160.75	99.33		
	-160	99.95		
	-160	100		
	-171	0	40	60 cm Recommendation ITU-R BO.1443, Annex 1
	-168.75	90		
	-167.75	97.8		
	-162	99.6		
	-161	99.8		
	-160.2	99.9		
	-160	99.99		
	-160	100		
	-173.75	0	40	90 cm Recommendation ITU-R BO.1443, Annex 1
	-173	33		
	-171	98		
	-165.5	99.1		
	-163	99.5		
	-161	99.8		
	-160	99.97		
	-160	100		
	-177	0	40	120 cm Recommendation ITU-R BO.1443, Annex 1
	-175.25	90		
	-173.75	98.9		
	-173	98.9		
	-169.5	99.5		
	-167.8	99.7		
	-164	99.82		
	-161.9	99.9		
	-161	99.965		
	-160.4	99.993		
	-160	100		