

## RECOMMENDATION ITU-R S.1715

**Guidelines developed in response to the studies requested  
in Resolution 140 (WRC-03)**

(2005)

The ITU Radiocommunication Assembly,

*considering*

- a) that Article 22 of the Radio Regulations (RR) contains  $\text{epfd}_{\downarrow}$  limits on non-GSO FSS systems which, if met, protect GSO FSS networks from unacceptable interference;
- b) that in the development of RR Article 22  $\text{epfd}_{\downarrow}$  limits for the 20 GHz FSS band, different considerations were made for the lower portion of the band (17.8-18.6 GHz) as compared to the upper portion (i.e. 19.7-20.2 GHz) of the band;
- c) that the temporal characteristics of the interference caused to GSO FSS networks by certain types of non-GSO FSS systems may be significantly different than those caused by other types of non-GSO FSS systems;
- d) that any non-GSO FSS use of the band 19.7-20.2 GHz is subject to RR No. 5.484A;
- e) that protection of GSO FSS networks in the band 19.7-20.2 GHz from unacceptable interference may be able to be provided by a certain type of non-GSO FSS<sup>1</sup> system that does not meet the  $\text{epfd}_{\downarrow}$  limits in RR No. 22.5C (Table 22-1C) subject to the agreement of the affected administration(s) under RR No. 22.5CA;
- f) that Resolution 140 (WRC-03) *invited ITU-R* to develop “criteria which would protect GSO FSS networks in the band 19.7-20.2 GHz from unacceptable interference by HEO FSS systems taking account of the combined effect of interference into downlinks of the GSO FSS networks from HEO FSS systems and other non-GSO FSS systems”;
- g) that Resolution 140 (WRC-03) *invited administrations* “to consider using the relevant ITU-R Recommendations regarding the protection of GSO FSS satellite networks from interference by non-GSO FSS systems as a guideline for consultation between administrations, to fulfil their obligations under RR No. 22.2 in the band 19.7-20.2 GHz, and in the case where an administration responsible for a non-GSO FSS system requests the application of RR No. 22.5CA”;

*noting*

- a) that GSO FSS networks with specific receive earth stations having very large antennas and non-GSO FSS systems operating in the 19.7-20.2 GHz frequency band are subject to coordination under RR No. 9.7A and No. 9.7B, as specified in Table 5-1 of RR Appendix 5;
- b) that in order to provide the required protection to GSO FSS networks, the long-term portion of the  $\text{epfd}_{\downarrow}$  limits in RR Article 22 in the 19.7-20.2 GHz band is about 15 dB more stringent than the corresponding limit in the 17.8-18.6 GHz band;
- c) that the effect on co-frequency sharing between non-GSO FSS systems of having some non-GSO FSS systems meet the RR Article 22  $\text{epfd}$  limits and having other systems meet the levels included in this Recommendation has not yet been evaluated,

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<sup>1</sup> Non-GSO FSS systems with an inclination between 35° and 145°, an apogee greater than 18 000 km, operating in a limited active arc, and not meeting the  $\text{epfd}_{\downarrow}$  limits in RR No. 22.5C (Table 22-1C).

*recommends*

**1** that the following guidelines could be applied in the event that an administration planning a certain type of non-GSO FSS system for operation in the 19.7-20.2 GHz band, which system does not meet the  $\text{epfd}_{\downarrow}$  limits specified in RR No. 22.5C (Table 22-1C) for this band, requests the application of RR No. 22.5CA in connection with Resolution 140 (WRC-03) with respect to its system:

- that any such system should provide protection to GSO FSS networks equivalent to that provided by the single entry  $\text{epfd}_{\downarrow}$  limits specified in Table 22-1C of RR No. 22.5C for this band;
- that the set of  $\text{epfd}_{\downarrow}$  masks shown in Table 1, which has been derived for a certain type of non-GSO FSS system that does not otherwise meet the  $\text{epfd}_{\downarrow}$  limits in the 19.7-20.2 GHz band based on the objective of providing, to GSO FSS networks, protection equivalent to that provided by the  $\text{epfd}_{\downarrow}$  masks contained in RR No. 22.5C (Table 22-1C), may be taken into consideration by an administration receiving such a request for application of RR No. 22.5CA, subject to its agreement, in any discussions concerning the possible application of RR No. 22.5CA;

**2** that administrations take note that, if they agree to permit a non-GSO FSS system to operate at the  $\text{epfd}_{\downarrow}$  levels of Table 1 on their territory, they are also agreeing (see Note 1), under *resolves* 2 of Resolution 76 (WRC-2000), to a level of aggregate  $\text{epfd}_{\downarrow}$  on their territory caused by all non-GSO systems (including those indicated in *recommends* 1) that is higher than the corresponding level in Table 1C of Resolution 76 (WRC-2000) by an amount which accommodates the higher  $\text{epfd}_{\downarrow}$  levels in Table 1 in addition to the  $\text{epfd}_{\downarrow}$  caused by systems operating in compliance with the single entry  $\text{epfd}_{\downarrow}$  limits in Table 22-1C of RR No. 22.5C;

**3** that the following Notes be considered as part of this Recommendation.

NOTE 1 – The single entry  $\text{epfd}_{\downarrow}$  levels in Table 1 are higher than the aggregate long-term limits in Table 1C of Resolution 76 (WRC-03).

NOTE 2 – This alternative Table is not meant to be considered in conjunction with the  $\text{epfd}_{\downarrow}$  limits of RR Article 22, but instead is to be used on its own in situations where a non-GSO FSS system does not meet the  $\text{epfd}_{\downarrow}$  limits and application of RR No. 22.5CA is requested.

NOTE 3 – Administrations operating or planning to operate non-GSO FSS systems that would rely on RR No. 22.5CA and this Recommendation for use of the 19.7-20.2 GHz band should not request protection or accommodation in intersystem coordination with other co-frequency non-GSO FSS systems that do not rely on RR No. 22.5CA at levels beyond those which a system that meets the applicable limits could request.

TABLE 1

**An illustrative example of the single-entry  $\text{epfd}_{\downarrow}$  radiated by a certain type of non-GSO satellite system in the FSS in the frequency band 19.7-20.2 GHz**

Frequency band (GHz)	$\text{epfd}_{\downarrow}$ (dB(W/m <sup>2</sup> ))	Percentage of time during which $\text{epfd}_{\downarrow}$ may not be exceeded	Reference bandwidth (kHz)	Reference antenna diameter and reference radiation pattern <sup>(1)</sup>
19.7-20.2	-172.4	100	40	70 cm Recommendation ITU-R S.1428
	-158.4	100	1 000	
	-174.0	100	40	90 cm Recommendation ITU-R S.1428
	-160.0	100	1 000	
	-182.8	100	40	2.5 m Recommendation ITU-R S.1428
	-168.8	100	1 000	
	-187.6	100	40	5 m Recommendation ITU-R S.1428
	-173.6	100	1 000	

<sup>(1)</sup> For this Table, reference patterns of Recommendation ITU-R S.1428 should be used only for the calculation of interference from non-GSO satellite systems in the FSS into GSO satellite networks in the FSS.