

WRC-2003 Advisory Committee

IWG-3

Draft U.S. Proposal on WRC-03 Agenda Item 1.29 (Resolution 78 (WRC-2000))

Agenda Item 1.29: *“to consider the results of studies related to Resolutions 136 (WRC-2000) and 78 (WRC-2000) dealing with sharing between non-GSO and GSO systems”*

Background information

WRC-2000 adopted a combination of single-entry validation, operational and, for 3 and 10 meter antennas in the 10.7-12.75 GHz band, single-entry additional operational epfd_{\downarrow} limits contained in Article **S22**, along with the aggregate epfd_{\downarrow} limits in Resolution **78 (WRC-2000)**, which apply to non-GSO FSS systems to protect GSO networks in the bands 10.7-12.75 GHz, 17.8-18.6 GHz, and 19.7-20.2 GHz. The operational epfd_{\downarrow} limits were adopted to protect *operational* GSO FSS networks from interference levels that may result in loss of synchronization, or loss of capacity, or severe degradation in performance.

Compliance with the operational epfd_{\downarrow} and additional operational epfd_{\downarrow} limits is not subject to verification by the ITU-BR but by individual administrations. In the case of operational epfd_{\downarrow} limits, verification would be made by measurement conducted by administrations and/or their GSO system operators. A commitment by the administration (and their non-GSO operator) that the system filed will meet the additional operational epfd_{\downarrow} limits is part of the Appendix **S4** coordination data. A non-GSO system causing interference must reduce its epfd_{\downarrow} power levels towards the affected GSO earth station to meet the single-entry operational epfd_{\downarrow} limits unless otherwise agreed by the concerned administrations.

The ITU-R has identified the need for specific procedures that correct in the most expeditious manner any cases where the operational epfd_{\downarrow} (see Tables **S22-4A** through **S22-4C**) or additional operational epfd_{\downarrow} limits (see Table **S22-4A1**) are exceeded, by the inclusion of appropriate procedures in the Radio Regulations. Resolution **78 (WRC-2000)**, *Development of procedures in case the operational or additional operational limits in Article S22 are exceeded*, invites the ITU-R to undertake the appropriate regulatory studies to develop procedures in cases where the operational epfd_{\downarrow} limits in the bands 10.7-12.75 GHz, 17.8-18.6 GHz, and 19.7-20.2 GHz or the single-entry additional operational epfd_{\downarrow} limits for 3 and 10 meter antennas in the 10.7-12.75 GHz band are exceeded at an operational GSO earth station.

The U.S. recognizes the need to correct in an expeditious manner any cases where the single-entry operational or additional operational limits in Section II of Article **S22** are exceeded. It has determined that the preferred way to satisfy this need is to include in Section II of Article **S22** a regulatory provision that incorporates a WRC resolution that contains procedures that facilitate the rapid identification of which non-GSO system in a multiple-non-GSO system environment is responsible for an exceedance of the operational and/or additional operational epfd_{\downarrow} limits. The procedures proposed include relatively tight time periods for the taking of certain actions – in recognition of the fact that if an exceedance is observed, the interference being received is unacceptable *per se* under **No. S22.5I** of the Radio Regulations. As the procedures are of extremely limited applicability (they only apply to exceedances of the operational and/or additional operational epfd_{\downarrow} limits in **No. S22.5I** and its associated tables by non-GSO systems that are subject to the limits), it is most appropriate that they be included in a resolution that is referenced in **No. S22.5I** directly.

Proposals:

USA/xx/1

MOD

S22.5I 6) An administration operating a non-geostationary-satellite system in the fixed-satellite service which is in compliance with the limits in Nos. **S22.5C**, **S22.5D** and **S22.5F** shall be considered as having fulfilled its obligations under No. **S22.2** with respect to any geostationary-satellite network, irrespective of the dates of receipt by the Bureau of the complete coordination or notification information, as appropriate, for the non-geostationary-satellite system and the geostationary-satellite network, provided that the epfd_{\downarrow} radiated by the non-geostationary-satellite system in the fixed-satellite service into any operating geostationary fixed-satellite service earth station does not exceed the operational and additional operational limits given in Tables **S22-4A**, **S22-4A1**, **S22-4B** and **S22-4C**, when the diameter of the earth station antenna is equal to the values given in Table **S22-4A**, **S22-4A1** or **S22-4C**, or the gain of the earth station is equal to or greater than the values given in Table **S22-4B** for the corresponding orbital inclination of the geostationary fixed-satellite service satellite. Except as otherwise agreed between concerned administrations, an administration operating a non-geostationary-satellite system in the fixed-satellite service that is subject to the limits in Nos. **S22.5C**, **S22.5D** and **S22.5F** and which radiates epfd_{\downarrow} into any operating geostationary fixed-satellite service earth station at levels in excess of the operational or additional operational limits given in Tables **S22-4A**, **S22-4A1**, **S22-4B** and **S22-4C**, when the diameter of the earth station antenna is equal to the values given in Table **S22-4A**, **S22-4A1** or **S22-4C**, or the gain of the earth station is equal to or greater than the values given in Table **S22-4B** for the corresponding orbital inclination of the geostationary fixed-satellite service satellite, shall be considered to be in violation of its obligations under No. **S22.2**. The provisions of Resolution XXX (WRC-03) shall apply in the event of noncompliance with the single-entry operational and additional operational limits in Section II of Article S22 by a non-geostationary satellite system in the fixed-satellite service that is subject to the limits in Nos. S22.5C, S22.5D and S22.5F.

Reasons: A violation of the operational and/or additional operational epfd_{\downarrow} limits by a non-GSO FSS system subject to the limits is *per se* a violation of No. **S22.2** of the Radio Regulations. As multiple non-GSO FSS systems may be in operation at any one time, any one of which could be responsible for the violation, it is imperative that reasonable and expeditious procedures be available to administrations of victim GSO networks to enable them swiftly to identify the interfering non-GSO system and initiate effective corrective measures. The inclusion in No. **S22.5I** of a reference to a new WRC-03 resolution (see proposal USA/xx/2 below) that contains these procedures is a critical element of this approach.

USA/xx/2

ADD

RESOLUTION XXX (WRC-2003)

**Procedures in case the operational or additional
operational limits in Article S22 are exceeded**

The World Radiocommunication Conference (Caracas, 2003),

considering

- a) that WRC-2000 adopted in Article **S22** single-entry operational limits (see Tables **S22-4A** through **S22-4C**) and single-entry additional operational efd↓ limits (see Table **S22-4A1**) applicable to non-geostationary (non-GSO) fixed-satellite service (FSS) systems (space-to-Earth) in certain parts of the frequency range 10.7-20.2 GHz to protect geostationary systems operating in the same frequency bands;
- b) that, taking into account Nos. **S22.5H** and **S22.5I**, wherever the limits referred to in *considering a)* are exceeded by a non-GSO FSS system to which the limits apply, this constitutes a violation of No. **S22.2**;
- c) that WRC-2000 identified the need for specific procedures that correct in the most expeditious manner any cases where the limits in *considering a)* are exceeded, by the inclusion of appropriate procedures in the Radio Regulations;
- d) that the ITU-R has developed Recommendations ITU-R S.1527 and [S.4BL23] to assist administrations in identifying the source of interference in excess of the operational efd↓ levels and measuring levels of efd↓ levels to verify compliance with the operational limits, respectively;
- e) that no procedures currently exist in the Radio Regulations to expeditiously address the unique regulatory situation of **S22.5I**;

resolves

that the procedures contained in the Annex be applied in the event of noncompliance with the single-entry operational and additional operational limits in Section II of Article **S22** by a non-geostationary satellite system in the fixed-satellite service that is subject to the limits in Nos. **S22.5C**, **S22.5D** and **S22.5F**.

ANNEX

Procedures to be applied in the event of non-compliance with single-entry operational and additional operational limits in Section II of Article S22

- 1 It is essential that Member States exercise the utmost goodwill and mutual assistance in the application of these procedures for the expeditious elimination of equivalent power flux density (epfd_↓) interference from non-geostationary satellite systems in the fixed-satellite service at levels above the operational epfd_↓ limits given in Tables **S22-4A**, **S22-4B** and **S22-4C** and/or the additional operational epfd_↓ limits given in Table **S22-4A1** (“excess epfd_↓ interference”).
- 2 In securing the expeditious elimination of excess epfd_↓ interference, due consideration should be given to all factors involved, including the relevant technical and operational factors.
- 3 Administrations should cooperate in the detection and elimination of excess epfd_↓ interference.
- 4 Where practicable, and subject to agreement between the administrations concerned, the case of excess epfd_↓ interference may be dealt with directly between their operating organizations.
- 5 When a case of excess epfd_↓ interference to a frequency assignment in a geostationary satellite network is detected at an operating earth station associated with the geostationary satellite network and such excess epfd_↓ interference cannot be accepted by the affected administration, the affected administration should first attempt to identify the source of the excess epfd_↓ interference. For purposes of these procedures, the term “affected administration” shall mean the administration on whose territory the receiving earth station associated with the geostationary satellite network is located or its designee.
- 6 If an affected administration referred to in No. 5 has difficulty in determining the source or characteristics of the excess epfd_↓ interference:
 - a) It may send a request for cooperation to any administration which has submitted to the Bureau complete advance publication, coordination, or notification information, as appropriate, for non-GSO FSS systems with overlapping frequency assignments that have been brought into use in the frequency bands subject to the limits referred to in No. 1, providing all relevant details in a Report of Excess epfd_↓ Interference utilizing the form [to be developed] provided in the Attachment to these procedures. A copy of any such request, including the Report of Excess epfd_↓ Interference, should be sent to Bureau.
 - b) Upon receipt of such a request for cooperation under No. 6 a), each administration should, as soon as possible but within 15 days, acknowledge receipt and send to the requesting administration(s), with a copy to the Bureau, information that may be used to identify the source of the excess epfd_↓ interference and/or to eliminate one or more non-GSO FSS systems referred to in No. 6 a) as the source of the excess epfd_↓ interference.
 - c) If an administration fails to respond within 15 days of receipt to a request for cooperation under No. 6a), an affected administration may request the assistance of the Bureau, in which case Bureau should forthwith request the non-responding administration, to provide the information referred to in No. 6b) within 15 days of an affected administration's request for the assistance of the Bureau.

- d) If an administration fails to respond to the Bureau within the time period established in No. 6c) above, the Bureau should:
- If the procedure of Article S11 has not been completed for the frequency assignments of the non-geostationary satellite system in the fixed-satellite service in question, publish a remark in the IFIC within one month to the effect that the responsible administration did not respond to a request for cooperation regarding an unresolved complaint of excess epfd_{\downarrow} interference; or
 - If the procedure of Article S11 has been completed for the frequency assignments of the non-geostationary satellite system in the fixed-satellite service in question, enter a remark in the Remarks column of the Master Register against the relevant frequency assignments of the non-GSO FSS system in question to the effect that the responsible administration did not respond to a request for cooperation regarding an unresolved complaint of excess epfd_{\downarrow} interference.
- 7** Upon receipt of the information identified in No. 6a), the Bureau should promptly communicate to all administrations contacted under No. 6a) the identity of any non-geostationary fixed-satellite service systems that, on the basis of determining compliance with the epfd_{\downarrow} validation limits in Tables S22-1A through S22-1D, the Bureau has concluded to have a maximum epfd_{\downarrow} lower than the limits referred to in No. 1, for all pointing directions towards the geostationary-satellite orbit and therefore would not be responsible for causing epfd_{\downarrow} interference in excess of the limits referred to in No. 1.
- 8** Once the source(s) of the excess epfd_{\downarrow} interference have been identified, an affected administration may send a letter, by fax or other mutually agreed electronic means, to the administration(s) concerned and request immediate corrective action. It should give all useful information, including a Report of Excess epfd_{\downarrow} Interference, to enable the responding administration(s) to take such steps as may be necessary to reduce the interference to the epfd_{\downarrow} levels required in Table **S22-4A**, **S22-4A1**, **S22-4B** or **S22-4C**, as appropriate, or to higher levels as may otherwise be or have been agreed between concerned administrations pursuant to **No. S22.5I**. A copy of any such request for immediate corrective action, including the Report of Excess epfd_{\downarrow} Interference, should be sent to Bureau.
- 9** Upon receipt of such a request for immediate corrective action under No. 8, an administration should acknowledge receipt to the requesting administration within 15 days, with a copy to the Bureau. Such acknowledgement would not constitute acceptance of responsibility.
- 10** Within 15 days after receipt of a request for immediate corrective action pursuant to No. 8 above, the administration receiving the request should either:
- a) Provide the requesting administration and the Bureau with information indicating that no non-geostationary fixed-satellite service system for which it is responsible could have caused the excess epfd_{\downarrow} interference experienced by the receiving earth station associated with the geostationary satellite network; or
 - b) Acknowledge responsibility for causing the excess epfd_{\downarrow} interference and immediately reduce emissions of the interfering system into the affected receiving earth station associated with the geostationary satellite network to the epfd_{\downarrow} levels specified in Table **S22-4A**, **S22-4A1**, **S22-4B** or **S22-4C**, as appropriate, or to the epfd_{\downarrow} levels otherwise agreed between concerned administrations pursuant to **No. S22.5I**, whichever is higher.

Full particulars of the action taken by the administration responsible for causing the excess epfd_{\downarrow} interference should be provided to the requesting administration.

In either case, the Bureau should be informed of the action taken.

11 If an administration fails to act in accordance with No. 10 above, an affected administration may request the assistance of the Bureau, in which case the Bureau should forthwith request the non-responding administration to act in accordance with No. 10 within 15 days of the affected administration's request for the assistance of the Bureau.

12 If the administration fails to respond to the Bureau within the time period established in No. 11 above, the Bureau should:

- If the procedure of Article S11 has not been completed for the frequency assignments of the non-geostationary satellite system in the fixed-satellite service in question, publish a remark in the IFIC within one month to the effect that the responsible administration did not respond to a request for immediate corrective action regarding an unresolved complaint of excess epfd_{\downarrow} interference; or
- If the procedure of Article S11 has been completed for the frequency assignments of the non-geostationary satellite system in the fixed-satellite service in question, enter a remark in the Remarks column of the Master Register against the relevant frequency assignments of the non-GSO FSS system in question to the effect that the responsible administration did not respond to a request for immediate corrective action regarding an unresolved complaint of excess epfd_{\downarrow} interference.

13 If an administration acknowledges responsibility for causing the excess epfd_{\downarrow} interference pursuant to No. 10*b*) above, but fails to reduce immediately emissions of the interfering system as required:

- a) It should have an additional 10 days to take the necessary action to correct the excess epfd_{\downarrow} interference situation pursuant to No. **S15.21** of the Radio Regulations.
- b) If, after the 10-day period, the administration responsible for the interference has still not reduced emissions of the interfering system as required, the Bureau should:
 - If the procedure of Article S11 has not been completed for the frequency assignments of the non-geostationary satellite system in the fixed-satellite service in question, publish a remark in the IFIC within one month to the effect that the responsible administration is in contravention of its obligations under No. S22.2 and No. S22.5I; or
 - If the procedure of Article S11 has been completed for the frequency assignments of the non-geostationary satellite system in the fixed-satellite service in question, enter a remark in the Remarks column of the Master Register against the relevant frequency assignments of the non-GSO FSS system in question to the effect that the use of the affected frequency assignments by the interfering system is in contravention of its obligations under No. S22.2 and No. S22.5I of the Radio Regulations. Notice of the entry of the remark should be included in the IFIC.

14 The Bureau should retain any entry in the Remarks column of the Master Register made pursuant to No. 6*d*), No. 12 or No. 13*b*) above, which should remain in place until such time as the non-responding administration responds and/or corrects the excess epfd_{\downarrow} interference, as appropriate.

ATTACHMENT**Report of Excess efd_l Interference Form**

[To Be Developed]

Reasons: The development of procedures to help secure prompt identification of violators of the operational and/or additional operational efd_l limits was found by WRC-2000 to be necessary to effect the proper balance that WRC-2000 achieved between GSO and non-GSO systems in Section II of Article **S22** of the Radio Regulations. The U.S. believes that it is most appropriate to include the procedures, which apply only to certain exceedances of the levels in **No. S22.5I** of the Radio Regulations, in a resolution called out in **No. S22.5I**. The procedures themselves have been developed within the ITU-R, and provide administrations operating non-GSO FSS systems with the proper incentive to cooperate to expeditiously resolve exceedances of the operational and/or additional operational efd_l limits without imposing undue administrative or regulatory burdens.

USA/xx/3

SUP

~~RESOLUTION 78 (WRC 2000)~~~~**Development of procedures in case the operational or additional operational limits in Article S22 are exceeded**~~

Reasons: Consequential to the modification of **No. S22.5I** and the adoption of Resolution **XXX (WRC-03)** (see proposals USA/xx/1 and USA/xx/2 above).