

## RECOMMENDATION ITU-R S.1672

**Guidelines to be used in the event of non-compliance with single-entry operational and/or additional operational limits in Section II of Article 22 of the Radio Regulations**

(Question ITU-R 231/4)

(2003)

The ITU Radiocommunication Assembly,

*considering*

- a) that WRC-2000 adopted in Article 22 of the Radio Regulations (RR) single-entry operational limits (see RR Tables 22-4A through 22-4C) and single-entry additional operational  $\text{epfd}_{\downarrow}$  limits (see RR Table 22-4A1) applicable to non-GSO FSS systems (space-to-Earth) in certain parts of the frequency range 10.7-20.2 GHz to protect GSO systems operating in the same frequency bands;
- b) that, taking into account RR Nos. 22.5H and 22.5I, 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 RR No. 22.2;
- c) that WRC-2000 identified the need to conduct, as a matter of urgency, the appropriate regulatory studies to develop procedures for application in cases where the power limits referred to in *considering a)* are exceeded at an operational earth station;
- d) that the existing provisions in the RR (including the provisions of Section V of RR Article 15) apply to the resolution of interference, including cases where non-GSO systems exceed the limits referred to in *considering a)*;
- e) that the RR Article 15 Section VI procedures, which also apply, are general and provide no time lines or specific guidance on the steps to be taken by administrations or the Radiocommunication Bureau (Bureau);
- f) that an ITU-R Recommendation containing a set of guidelines in an Annex to it could provide more structure, if need be, for cases where non-GSO systems exceed the limits referred to in *considering a)*;
- g) that Recommendation ITU-R S.1527 contains a methodology for the identification of non-GSO satellites causing interference into an operating GSO earth station;
- h) that Recommendation ITU-R S.1558 contains methodologies for measuring  $\text{epfd}_{\downarrow}$  caused by a non-GSO space station to verify compliance with operational  $\text{epfd}_{\downarrow}$  limits;
- j) that Recommendation ITU-R S.1592 contains a methodology to assess compliance of non-GSO FSS satellite systems with the additional operational limits on  $\text{epfd}_{\downarrow}$  in RR Article 22;
- k) that Recommendation ITU-R S.1554 contains a methodology for determining the overall accuracy of  $\text{epfd}_{\downarrow}$  measurements,

*noting*

a) that under the RR a non-GSO system in the FSS that is subject to the limits in RR Nos. 22.5C, 22.5D and 22.5F and which radiates  $\text{epfd}_{\downarrow}$  into any operating GSO FSS earth station at levels in excess of the operational or additional operational limits given in RR Tables 22-4A, 22-4A1, 22-4B and 22-4C is, unless otherwise agreed between concerned administrations, considered to be in violation of its obligations under RR No. 22.2,

*recommends*

1 that the relevant ITU-R Recommendations referred to in *considering* g), h), j) and k) should be used by administrations in determining whether non-GSO systems exceed the limits referred to in *considering* a);

2 that in addition to applying the relevant provisions of RR Article 15 the set of guidelines given in Annex 1 could be used by administrations, with assistance from the Bureau if necessary, to resolve cases where non-GSO systems exceed the limits referred to in *considering* a).

## Annex 1

### **Guidelines for use in the event of non-compliance with single-entry operational and/or additional operational limits in Section II of RR Article 22**

1 In securing the expeditious elimination of  $\text{epfd}_{\downarrow}$  interference from non-GSO systems in the FSS at levels above the operational  $\text{epfd}_{\downarrow}$  limits given in RR Tables 22-4A, 22-4B and 22-4C and/or the additional operational  $\text{epfd}_{\downarrow}$  limits given in RR Table 22-4A1 (excess  $\text{epfd}_{\downarrow}$  interference), due consideration should be given to all factors involved, including the relevant technical and operational factors.

2 Administrations should cooperate in the detection and elimination of excess  $\text{epfd}_{\downarrow}$  interference.

3 Where practicable, and subject to agreement between the administrations concerned, the case of excess  $\text{epfd}_{\downarrow}$  interference may be dealt with directly between their operating organizations.

4 When a case of interference exceeding an operational  $\text{epfd}_{\downarrow}$  limit to an assignment in a GSO satellite network is established (for example using Recommendation ITU-R S.1558) by the operator of an earth station associated with the GSO satellite network and such excess  $\text{epfd}_{\downarrow}$  interference cannot be accepted by the affected administration, the affected administration should first attempt to identify the source of the excess  $\text{epfd}_{\downarrow}$  interference. Recommendation ITU-R S.1527 may be employed for this purpose.

When a case of interference exceeding an additional operational limit mask to a frequency assignment in a GSO satellite network is identified and such excess  $\text{epfd}_{\downarrow}$  interference cannot be accepted by the affected administration, the affected administration should take steps to compute the excess interference using the published parameters of the non-GSO system concerned. Software as specified in Recommendation ITU-R S.1592 may be employed to this end.

The term “affected administration” means the administration on whose territory the receiving earth station associated with the GSO satellite network is located or its designee.

**5** In the event that an affected administration referred to in § 4 has difficulty in determining the source, or characteristics of excess operational  $\text{epfd}_{\downarrow}$  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 § 1, providing all relevant details in a report of non-compliance with single-entry operational and/or additional operational  $\text{epfd}_{\downarrow}$  limits in Section II of RR Article 22 utilizing the form provided in Appendix 1 to this Annex. A copy of any such request, including the report of non-compliance with single-entry operational and additional operational  $\text{epfd}_{\downarrow}$  limits in Section II of RR Article 22, may be sent to the Bureau.
- b) It may request the assistance of the Bureau to identify the administrations referred to in § 5 a). It is anticipated that, upon receipt of such a request for assistance, the Bureau would promptly communicate to the requesting administration the list of administrations which have submitted to the Bureau complete advance publication, coordination or notification information, as appropriate, for a non-GSO system in the FSS in the frequency bands referred to in item 1 with overlapping frequency assignments that have been brought into use. Upon receipt from the Bureau of the list of administrations, the affected administration should then apply § 5 a).
- c) Upon receipt of such a request for cooperation under § 5 a), each administration should, as soon as possible and preferably within 30 days, acknowledge receipt and send to the requesting administration information that may be used to identify the source of the excess  $\text{epfd}_{\downarrow}$  interference and/or to eliminate one or more non-GSO FSS systems referred to in § 5 a) as the source of the excess  $\text{epfd}_{\downarrow}$  interference.
- d) Should an administration fail to respond within a reasonable period (preferably within 30 days) of receipt to a request for cooperation under § 5 a) and the problem remains otherwise unresolved, an affected administration may request the assistance of the Bureau, in which case it is anticipated that the Bureau would request the non-responding administration to provide the information referred to in § 5 c) as soon as possible.
- e) Should an administration fail to respond to such a request by the Bureau within a reasonable further period and the problem should still remain unresolved, the affected administration would continue to have recourse to the relevant provisions of RR Article 15.

**6** Once the source of excess  $\text{epfd}_{\downarrow}$  interference has been identified, an affected administration may send a letter, by fax or other mutually agreed electronic means, to the administration concerned and request prompt corrective action. It should give all useful information, including a report of non-compliance with single-entry operational and/or additional operational  $\text{epfd}_{\downarrow}$  limits in Section II of RR Article 22 utilizing the form provided in Appendix 1 to this Annex. This will enable the responding administration to take such steps as may be necessary to reduce the interference to the  $\text{epfd}_{\downarrow}$  levels required in RR Table 22-4A, 22-4A1, 22-4B or 22-4C, as

appropriate, or to higher levels as may otherwise be or have been agreed between concerned administrations pursuant to RR No. 22.5I. A copy of any such request for immediate corrective action, including the report of excess  $\text{epfd}_{\downarrow}$  interference, may be sent to the Bureau.

7 Upon receipt of such a request for corrective action under § 6, an administration should promptly acknowledge receipt to the requesting administration, and may send a copy to the Bureau.

8 As soon as practicable and preferably within 30 days after receipt of a request for corrective action pursuant to § 6, the administration receiving the request should either:

- a) provide the requesting administration (and the Bureau where appropriate) with technical information and analysis indicating that no non-GSO FSS system for which it is responsible could have caused the excess  $\text{epfd}_{\downarrow}$  interference experienced by the receiving earth station associated with the GSO satellite network; or
- b) acknowledge responsibility for causing the excess  $\text{epfd}_{\downarrow}$  interference and immediately reduce emissions of the interfering system into the affected receiving earth station associated with the GSO satellite network to the  $\text{epfd}_{\downarrow}$  levels specified in RR Table 22-4A, 22-4A1, 22-4B or 22-4C, as appropriate, or to the  $\text{epfd}_{\downarrow}$  levels otherwise agreed between concerned administrations pursuant to RR No. 22.5I, whichever is higher.

The Bureau may be informed of the action taken.

9 If an administration fails to act in accordance with § 8, an affected administration may request the assistance of the Bureau, in which case it is anticipated that the Bureau would promptly request the non-responding administration to act in accordance with § 8 as soon as possible.

10 If the administration fails to respond to the Bureau within a reasonable further period or, having acknowledged responsibility, fails to rectify the problem promptly, the affected administration would continue to have recourse to the relevant provisions of RR Article 15.

## **Appendix 1 to Annex 1**

### **Report of non-compliance with single-entry operational and/or additional operational $\text{epfd}_{\downarrow}$ limits in Section II of RR Article 22**

#### ***Part I***

Particulars furnished by the administration responsible for the operating GSO FSS earth station receiving  $\text{epfd}_{\downarrow}$  levels exceeding the operational limits in RR Tables 22-4A through 22-4C (including additional operational limits in RR Table 22-4A1):

- a) Name of earth station:
- b) Antenna diameter of the receiving earth station:
- c) Name of the transmitting GSO space station whose downlink is interfered with:

- d) Longitude of the GSO space station:
- e) Orbital inclination of the GSO space station:
- f) Latitude, longitude, azimuth and elevation angle of the earth station at which the  $\text{epfd}_\downarrow$  levels exceeded any of the operational or additional operational limits in RR Tables 22-4A through 22-4C:
- g) Characteristics of the wanted emission at the receiving station:
  - Class of emission:
  - Bandwidth (indicate whether measured or estimated, or indicate the necessary bandwidth notified to the Bureau):
  - Frequency measured:
    - Date:
    - Time (UTC):
  - Field strength or pfd:
    - Date:
    - Time (UTC):
- h) Polarization of the receiving antenna or observed polarization:

## ***Part II***

Particulars concerning the non-GSO system exceeding the operational  $\text{epfd}_\downarrow$  limits:

- a) Name of non-GSO system, if known, or other means of identification:
- b) Frequency measured:
- c) Type of emission:
- d) Bandwidth (indicate whether measured or estimated):
- e) Nature of interference, e.g. occasional loss of demodulator synchronization, reduction in short-term  $C/(N + I)$  performance, etc.:
- f) Received  $\text{epfd}_\downarrow$  in excess of limit:
  - Dates:
  - Times (UTC):
  - Durations (s):
  - Intervals between successive events (s):
  - Method used to determine exceedance of  $\text{epfd}_\downarrow$  limit (e.g. Recommendation ITU-R S.1558):
  - Method of identification of non-GSO system responsible (e.g. Recommendation ITU-R S.1527), if known:
- g) Applicable  $\text{epfd}_\downarrow$  limit in RR Article 22, Tables 22-4A through 22-4C:
- h) Class of station and nature of service, if known:

***Part III***

Particulars concerning the non-GSO system exceeding the additional operational  $\text{epfd}_{\downarrow}$  limits:

- a) Name of non-GSO system:
  - b) Frequency at which  $\text{epfd}_{\downarrow}$  statistics calculated:
  - c) Class of emission:
  - d) Emission bandwidth:
  - e) Calculated  $\text{epfd}_{\downarrow}$  statistics:
    - Period over which results calculated (days):
    - Bandwidth in which  $\text{epfd}$  calculated:
    - Method of calculation (e.g. Recommendation ITU-R S.1592) and identification of software:
    - Source of transmission parameters for non-GSO system:
  - f) Applicable  $\text{epfd}_{\downarrow}$  limits in RR Article 22, Table 22-4A1:
  - g) Polarization:
  - h) Class of station and nature of service:
-