



Radiocommunication Bureau (BR)

Circular Letter
CCRR/60

2 May 2018

To Administrations of Member States of the ITU

Subject: **Draft Rules of Procedure**

At its 77th meeting (19 – 23 March 2018), the Radio Regulations Board considered the impact of WRC-15 decisions on the current Rules of Procedure, as well as difficulties in the application of certain regulatory provisions experienced by the Radiocommunication Bureau, and agreed on the schedule for considering draft new and modified existing Rules of Procedure contained in the document [Revision 8 to Document RRB16-2/3 - RRB18-2/1](#) to be considered at the 78th meeting of the RRB. Accordingly, the Bureau prepared a set of draft new or modified Rules of Procedure annexed to this Circular Letter:

- Annex 1, modification to the existing Rule of Procedure on No. **4.4** (this Annex also contains an historical background on the application of RR No. **4.4** for information);
- Annex 2, modification to the existing Rule of Procedure on the receivability of forms of notice;
- Annex 3, modification to the existing Rule of Procedure on No. **9.11A**;
- Annex 4, modification to the existing Rule of Procedure on No. **9.27**;
- Annex 5, modification to the existing Rule of Procedure on No. **11.48**;
- Annex 6, suppression of the existing Rule of Procedure on § 5.2.2.2 of Appendices **30** and **30A**
- Annex 7, modification to the existing Rule of Procedure in Part A, Section A10;
- Annex 8, modification to the existing Rule of Procedure in Part B, Section B3.

In accordance with No. **13.17** of the Radio Regulations, these draft Rules of Procedure are made available to administrations for comments before being submitted to the RRB pursuant to No. **13.14**. As indicated in No. **13.12A d)** of the Radio Regulations, any comments that you may wish to submit should reach the Bureau not later than **18 June 2018**, in order to be considered at the 78th meeting of the RRB, scheduled for 16 – 20 July 2018. Comments should be sent either by telefax to +41 22 730 5785 or by email to brmail@itu.int.



François Rancy
Director

Annexes: 8

Distribution:

- Administrations of Member States of ITU
- Members of the Radio Regulations Board

ANNEX 1

Rules concerning

ARTICLE 4 of the RR

MOD

4.4

1 Use of a frequency under ~~number~~ RR No. 4.4

1.1 ~~This provision states that "Administrations of the Member States shall not assign to a station any frequency in derogation of either the Table of Frequency Allocations in this Chapter or the other provisions of these Regulations, except on the express condition that such a station, when using such a frequency assignment, shall not cause harmful interference to, and shall not claim protection from harmful interference caused by, a station operating in accordance with the provisions of the Constitution, the Convention and these Regulations."~~ allows an administration to use any part of the spectrum in derogation of the Radio Regulations provided that the station using that spectrum part shall not cause harmful interference to, or shall not claim protection from harmful interference caused by, stations of other services operating in accordance with the provisions of the Constitution, Convention and Radio Regulations.

1.2 The scope of the terms "in derogation of either the Table of Frequency Allocations in this Chapter or the other provisions of these Regulations" is specified in No. 8.4 by the indication that the "other provisions" shall be identified and included in a Rule of Procedure. The Rules of Procedure on No. 11.31 provide a complete list of these "other provisions".

1.3 The scope of No. 4.4 is therefore limited to derogations to the provisions listed in the Rules of Procedure on No. 11.31. In particular, administrations intending to authorize the use of spectrum under No. 4.4 still have the obligation, under Nos. 11.2 and 11.3, to notify to the Bureau "any frequency assignment if its use is capable of causing harmful interference to any service of another administration". In addition, for space services, the relevant provisions of Article 9 cannot be waived in the case of frequency assignments planned to be operated under No. 4.4 and the obligation of applying Section I (for non-geostationary satellite networks) or No. 9.7 (for geostationary satellite networks), as appropriate, of this Article applies to such frequency assignments.

1.24 Further, ~~it~~ can be seen from Nos. 8.5 and 11.36 that the recording of an assignment with a reference to No. 4.4 includes the commitment by the notifying administration to immediately eliminate any harmful interference which is actually caused to other ~~uses~~ frequency assignments operated in accordance with the Radio Regulations upon receipt of advice thereof as soon as it is reported. This limitation on the use of an assignment notified with a reference to No. 4.4 is valid only when both categories of assignments detailed in No. 8.5 are in use.

1.5 The Board considers that the determination of whether or not a frequency assignment is capable of causing harmful interference to the services of another administration cannot lie only on the side of the administration operating the station that is producing the interference and other administrations should have information about a use under No. 4.4 to assess its interference potential or identify the source of interference. For this reason, an administration intending to use an

assignment under No. 4.4 has to notify this assignment to the Bureau prior to bringing it into use, which, for space services, includes the prior application of the relevant provisions of Article 9.

1.6 The Board also concluded that administrations, prior to bringing into use any frequency assignment to a transmitting station operating under No. 4.4, should:

- a) Conduct the relevant compatibility studies to provide assurance that the intended use of the frequency assignment to the station under No. 4.4 will not cause harmful interference into the services of other administrations operating in conformity with the Radio Regulations;
- b) Determine what measures it would need to take in order to comply with the requirement to immediately eliminate harmful interference pursuant to No. 8.5

Administrations should provide the results of the above studies and the measures to the Bureau, together with the notification under Article 11, for information only. If this supplementary information is received, the Bureau shall publish the material for the information of all potentially affected administrations.

1.37 Similarly and taking into account of No. 4.4 as well as of Nos. 5.43 and 5.43A, receiving frequencies-frequency assignments to receiving stations not in conformity with the Radio Regulations are recorded with a symbol which includes the indication that the notifying administration cannot claim protection from any harmful interference that may be caused by frequency assignments operated in accordance with the Radio Regulations.

See also Rules of Procedure relating to No.11.37.

NOC

2 Emissions in bands where uses other than those authorized are prohibited

***Reasons:** Stations with a significant interference potential to radiocommunication services of other administrations should not be considered under No. 4.4 since they could jeopardize the functioning of the stations of other administrations used in accordance with the Radio Regulations, defeating the very purpose of these Regulations.*

In this context, a recent increase in the number of filings for non-geostationary satellite networks in frequency bands which are not allocated under Article 5 to the relevant radiocommunication services is concerning. The analysis performed by the Bureau for some filings showed a potential for harmful interference to the services of other administrations. It was also noted that tests had been performed with High Altitude Platform Stations (HAPS) in bands not identified for HAPS, which is in contravention of provisions of No. 4.23. This trend may negatively impact the viability of the overall radiocommunication ecosystem.

The proposed modifications to this Rule of Procedure aims at reminding the obligations associated to the use of No. 4.4 (“not causing harmful interference”) and the provisions of No. 8.5 (what to do in case harmful interference occurs), which should not be seen as a way to dilute these obligations, but as a last resort in case all other necessary steps have been taken.

To this end, the proposed modifications require administrations, prior to bringing into use frequency assignments to transmitting stations operating under No. 4.4, to notify these assignments to the Bureau (for space services, this process includes the prior application of the relevant provisions of

Article 9, which, for most of the cases, means the publication of an API. It should however be noted that should an administration decide to use a frequency assignment to a geostationary satellite network under No. 4.4, this use would be published in a coordination request – CR/C). It is also recommended that Administrations conduct the relevant compatibility studies to ensure compliance with the obligation of No. 4.4 not to cause harmful interference to the services of other administrations operating in conformity with the Radio Regulations.

Such studies are normally based on typical characteristics of the incumbent services and might not take into account all varieties of stations in operation. Consequently, despite favourable results of compatibility studies, interference could occur and Administrations should therefore also determine the measures to be taken in order to immediately eliminate harmful interference pursuant to No. 8.5. Administrations are then invited to provide the results of the above studies and the measures to the Bureau, together with the notification of the frequency assignments. The Bureau will publish this data for the information of all potentially affected administrations.

The aim of these proposals is to make the provisions of Nos. 4.4 and 8.5 operational, thus preserving their original intent and the spirit of the Radio Regulations, in order to ensure the sustainability of the overall radiocommunication eco-system.

Effective date of application of the Rule: immediately after approval.

INFORMATIVE APPENDIX
ANALYSIS OF THE HISTORY OF RR No. 4.4

For the purposes of this analysis, the decisions of ITU radio conferences since the International Radiotelegraph Conference, Berlin 1906 have been scrutinized.

A brief summary of the evolution of No. **4.4** is the following:

- **Conferences of Berlin 1906, London 1912 and Washington, 1927** – established and further developed the International Radiotelegraph Convention. No provision similar to No. 4.4 was introduced by these Conferences;
- **Conference of Madrid, 1932** – firstly introduced a regulatory provision allowing to assign a frequency outside the authorized bands, subject to notification before bringing the assignment into use;
- **Conference of Atlantic City, 1947** - introduced the provision similar to the current No. **4.4** that a Member State shall not assign a frequency in derogation of either the Table or the other RR provisions, except on the express condition of not causing harmful interference. The condition of not claiming protection was absent. The Conference also introduced provision similar to the current No. **11.3** on the obligation to notify a station capable of causing harmful interference to another country;
- **Conference of Geneva, 1959** - introduced a provision similar to No. **8.5**, i.e. obligation of a non-conforming assignment to cease operation in case of interference;
- **WARC-79** – assigned number **342** to the provision that is currently No. **4.4**. It also modified the provision similar to No. **8.5** by replacing words “immediately cease operations” by “immediately eliminate this harmful interference”;
- **WRC-95** - renumbered No. **342** to **4.4** and added the second condition “shall not claim protection from harmful interference”. It also introduced a definition of “non-conforming assignment” in No. **8.4** and formulated No. **8.5** in its current wording;
- **WRC-97** - made a modification of No. **4.4** by changing words “*Administrations of the Members*” to “*Administrations of the Member States*” thus making its text identical with the current wording;

Since WRC-97 the content of Nos. **4.4**, **8.4**, **8.5** and **11.3** have not been changed.

With respect to the notification of assignments, including non-conforming ones, it is to be noted that the obligation to notify a station capable of causing harmful interference to any service of another administration remains unchanged since the International Radio Conference, Atlantic City, 1947.

The Table below contains more detailed information on the relevant decisions of ITU radiocommunication conferences.

Regulations related to the operation of non-conforming stations

Conference	Description of decisions	Extract from the RR
International Radiotelegraph Conference (Berlin, 1906)	<p>The first International Radiotelegraph Convention was signed between 27 administrations.</p> <p>The Convention and the Service Regulations annexed to the Convention were limited to radiotelegraph stations (coast stations and ship stations) and the wave lengths 300 and 600 m.</p> <p>No derogation in the operation of these two wave lengths.</p>	<p>ARTICLE 5 Distribution and use of frequencies (wave lengths) and types of emission</p> <p><i>§ 1. The Administrations of the contracting Governments may assign any frequency and any type of wave to any radioelectric station under their authority upon the sole condition that no interference with any service of another country results therefrom.</i></p>
International Radiotelegraph Conference (London, 1912)	<p>The International Radiotelegraph Convention and the Service Regulations continued to regulate radiotelegraph stations and wave lengths 300 and 600 m.</p> <p>No derogation in the operation of these two wave lengths.</p>	
International Radiotelegraph Conference (Washington, 1927)	<p>The Conference allowed existing broadcasting stations operated below 300 kHz not in conformity with the Table of distribution of frequencies to be moved to the band 160 – 224 kHz or 550 - 1 500 kHz.</p>	<p>ARTICLE 5 Distribution and use of frequencies (wave lengths) and types of emission</p> <p><i>§ 4. Nevertheless, the frequencies of all broadcasting stations at present working on frequencies below 300 kc/s (wavelengths above 1 000 m.) shall, in principle, be removed, not later than a year after the present Regulations come into force,</i></p>

Conference	Description of decisions	Extract from the RR
		<p><i>either into the band between 160 and 224 kc/s (wave lengths 1 875 to 1 340 m.) or into the band between 550 and 1 500 kc/s (wave lengths 545 to 200 m.).</i></p> <p><i>§ 5. No new broadcasting station shall be authorized to work in the band of frequencies between 160 and 224 kc/s (wave lengths 1 875 to 1 340 m.) unless no inconvenience therefrom will result to existing radiocommunication services, including broadcasting services conducted by stations which are already using frequencies in this band, and stations of which the frequencies are removed into this same band in conformity with the provisions of paragraph 4 above.</i></p>
International Radiotelegraph Conference, Madrid, 1932	The Conference allowed the assignment of a frequency outside the authorized bands, subject to notification at least 6, or in urgent cases 3 months, before bringing into use	<p>Article 7 Distribution and use of frequencies (wave-lengths) and types of emission</p> <p>62] (2) (a) <i>When, however, the frequency which an Administration intends to assign to a station is a frequency outside the bands authorised by the present Regulations for the service in question, this Administration shall make the notification provided for in the preceding sub-paragraph, by means of a special announcement at least six months before the frequency is brought into use and, in urgent cases, at least three months before that date.</i></p>
International Radiocommunication Conference, Cairo, 1938	The same provision, as in the Madrid 1932 Conference, but moved to Article 16 dealing with notification and publication of frequencies	<p>Article 16 Notification and Publication of Frequencies</p> <p>345 (6) (a) <i>When, however, the frequency which an Administration intends to assign to a fixed, land or broadcasting station is a frequency outside the bands authorised by these Regulations for the service in question, this Administration makes the notification prescribed in 344 at least six months before the frequency is brought into use and, in urgent cases, at least three months before that date</i></p>
International Radio Conference, Atlantic City, 1947	The Conference introduced a provision similar to the current No. 4.4, that a Member State country shall not assign	<p>ARTICLE 3 General Rules for the Assignment and Use of Frequencies</p>

Conference	Description of decisions	Extract from the RR
	<p>frequencies in derogation of the Table or the other RR provisions, except on the expressed condition of not causing harmful interference. But the other condition of the current No. 4.4, i.e. "shall not claim protection..." was absent.</p> <p><u>The Conference also introduced a provision similar to the current No. 11.3</u>, i.e. the obligation to notify a station capable of causing harmful interference to another country.</p> <p>The Conference decided that a recorded non-conforming frequency does not acquire the right to international protection</p>	<p>88 § 3. <i>A country, member of the Union, shall not assign to a station any frequency in derogation of either the table of frequency allocations given in this chapter or the other provisions of these Regulations, except on the express condition that harmful interference shall not be caused to services carried on by stations operating in accordance with the provisions of the Convention and of these Regulations.</i></p> <p>Article 11 Procedure in Connection with the International Frequency Registration Board, Preamble</p> <p>309 § 1. (1) <i>All of the frequency assignments to fixed, land, broadcasting, radionavigation land and standard frequency stations to be used for international communication or capable of causing harmful interference with any service of another country shall be notified to the Board and shall be recorded in the Master International Frequency Register in either of two columns.</i></p> <p>312 (3) <i>Any frequency assignment which, in any measure, contravenes the provisions of the Radio Regulations, but on the use of which the notifying country insists, shall be recorded in the NOTIFICATION COLUMN.</i></p> <p>313 <i>Such a record shall be made in order that the members of the International Telecommunication Union may take into account the fact that the frequency in question is in use; and an entry in the NOTIFICATION COLUMN shall not give the right of international protection to that frequency assignment except as provided for in 329.</i></p>
Administrative Radio Conference, Geneva, 1959	The Conference made a slight modification to No. 4.4 like provision of 1947. Words "A country, member of the Union" were	<p>ARTICLE 3 General Rules for the Assignment and Use of Frequencies</p> <p>115 § 3. <i>Administrations of the Members and Associate Members of the Union shall not assign to a station any frequency in derogation of either the Table of</i></p>

Conference	Description of decisions	Extract from the RR
	<p>replaced by “Administrations of the Members and Associate Members”</p> <p>The Conference introduced provision No. 611 similar to the current No. 8.5, i.e. obligation of non-conforming assignment to cease operation</p>	<p><i>Frequency Allocations given in this Chapter or the other provisions of these Regulations, except on the express condition that harmful interference shall not be caused to services carried on by stations operating in accordance with the provisions of the Convention and of these Regulations.</i></p> <p>ARTICLE 9. Notification and Recording of Frequencies in the Master International Frequency Register</p> <p>611 (5) <i>If harmful interference to the reception of any station whose assignment is in accordance with No. 501 is actually caused by the use of a frequency assignment which is not in conformity with No. 501, the station using the latter frequency assignment must immediately cease operations upon receipt of advice of this harmful interference.</i></p>
<p>WARC-79, Geneva, 1979</p>	<p>The Conference made a slight modification to No. 4.4 like provision of 1959. Words “Administrations of the Members and Associate Members” were replaced by “Administrations of the Members”. The provision was moved from Article 3 to Article 6 and became No. 342.</p> <p>In the provision similar to No. 8.5 words “<u>immediately cease operations</u>” were replaced by “<u>immediately eliminate this harmful interference</u>”⁷</p>	<p>ARTICLE 6 General Rules for the Assignment and Use of Frequencies</p> <p>342 § 4. <i>Administrations of the Members shall not assign to a station any frequency in derogation of either the Table of Frequency Allocations given in this Chapter or the other provisions of these Regulations, except on the express condition that harmful interference shall not be caused to services carried on by stations operating in accordance with the provisions of the Convention and of these Regulations.</i></p> <p>Articles 12 and 13 on notification of terrestrial and space services</p> <p>1419 (4) <i>If harmful interference to the reception of any station whose assignment is in accordance with No. 1240 or 1352 is actually caused by the use of a frequency assignment which is not in conformity with No. 1240 or 1352, the station using the latter frequency assignment shall, on receipt of advice thereof, immediately eliminate this harmful interference.</i></p>

Conference	Description of decisions	Extract from the RR
WARC-92, Malaga Torremolinos, 1992	NOC	NOC
WRC-93, Geneva, 1993	NOC	NOC
WRC-95, Geneva, 1995 – simplification of the Radio Regulations	<p>The Conference renumbered No. 342 to No. S4.4 and added the second condition “<i>shall not claim protection from harmful interference</i>”.</p> <p>WRC-95 also introduced a definition of “<i>non-conforming assignment</i>” and formulated No. S8.5 in its current wording</p>	<p>ARTICLE S4 Assignment and use of frequencies</p> <p>S4.4 <i>Administrations of the Members shall not assign to a station any frequency in derogation of either the Table of Frequency Allocations in this Chapter or the other provisions of these Regulations, except on the express condition that such a station shall not cause harmful interference to, and shall not claim protection from harmful interference caused by, a station operating in accordance with the provisions of the Constitution, the Convention and these Regulations.</i></p> <p>ARTICLE S8 Status of Frequency Assignments Recorded in the Master International Frequency Register</p> <p>S8.4 <i>A frequency assignment shall be known as a non-conforming assignment when it is not in accordance with the Table of Frequency Allocations or the other provisions of these Regulations. Such an assignment shall be recorded for information purposes, only when the notifying administration states that it will be operated in accordance with No. S8.5 (See also No. S4.4).</i></p> <p>S8.5 <i>If harmful interference to the reception of any station whose assignment is in accordance with No. S11.31 is actually caused by the use of a frequency assignment which is not in conformity with No. S11.31, the station using the latter frequency assignment must, upon receipt of advice thereof, immediately eliminate this harmful interference.</i></p>

Conference	Description of decisions	Extract from the RR
WRC-97	<p>The Conference made a slight modification of No. 4.4 by changing words “Administrations of the Members” to “Administrations of the Member States”.</p> <p>NOC for No. 8.5.</p>	<p>ARTICLE S4 Assignment and use of frequencies</p> <p>S4.4 <i>Administrations of the Member States shall not assign to a station any frequency in derogation of either the Table of Frequency Allocations in this Chapter or the other provisions of these Regulations, except on the express condition that such a station, when using such a frequency assignment, shall not cause harmful interference to, and shall not claim protection from harmful interference caused by, a station operating in accordance with the provisions of the Constitution, the Convention and these Regulations.</i></p>
WRC-2000	<p>The Conference renumbered all provisions by removing ‘S’, e.g. from No. S 4.4 to No. 4.4.</p> <p>NOC in substance</p>	
WRC-03	NOC	NOC
WRC-07	NOC	NOC
WRC-12	NOC	NOC
WRC-15	NOC	NOC

ANNEX 2

**Rules concerning the Receivability of forms of notice generally
applicable to all notified assignments submitted to
the Radiocommunication Bureau in application
of the Radio Regulatory Procedures***

1 Submission of information in electronic format

1.1 Space services

The Board noted the requirement for mandatory electronic filing and submission of comments/objections and requests for inclusion or exclusion specified in the *resolves* of Resolutions **55 (Rev.WRC-15) and 908 (Rev.WRC-15)**. It also noted that capture and validation software had been made available to administrations by the Bureau, including software to submit information required in Annex 2 of Resolution **552 (Rev.WRC-15) and in the Attachment to Resolution 553 (Rev.WRC-15)**. Accordingly, all information indicated in the *resolves* of Resolution **55 (Rev.WRC-15)**¹ and in Annex 2 of Resolution **552 (Rev.WRC-15)** and in the Attachment to Resolution **553 (Rev.WRC-15)** under § 8 and § 9, shall be submitted to the Bureau in electronic format (except graphical data which can still be submitted in paper form) which is compatible with the BR electronic notice form capture software (SpaceCap) and comments/objections software (SpaceCom)¹, using the ITU web interface “e-Submission of satellite network filings” available at <https://www.itu.int/itu-r/go/space-submission>.

1.2 Terrestrial services

Submission of frequency assignment/allotment notices for terrestrial services in the context of Articles **9, 11, 12** and Appendix **25** of the Radio Regulations and various regional agreements shall be made exclusively via the ITU web interface *WISFAT (Web Interface for Submission of Frequency Assignments/allotments)* available at <https://www.itu.int/ITU-R/go/wisfat/en>. It should be also noted that the Bureau has made available to administrations through the BR IFIC a software tool TerRaNotices for creating and validating notices by the Bureau. Additionally, an online validation tool is accessible via the ITU website at: <https://www.itu.int/ITU-R/terrestrial/OnlineValidation/Login.aspx>.

* **Note:** WRC-15 took the decision related to the RoP on the Receivability of forms of notice during the 8th Plenary, Par. 1.39 to 1.42 of Doc. CMR15/505, with the approval of Doc. CMR15/416 in relation to Section 3.2.2.4.1 of Doc. 4 (Add2) (Rev1), as follows:

“For the submission of a request for coordination under No. 9.30 related to a non-GSO satellite network or system, the notice will be receivable only in the cases described below:

- i) satellite systems with one (or more than one) set(s) of orbital characteristics and inclination value(s) with all frequency assignments to be operated simultaneously; and,*
- ii) satellite systems with more than one set of orbital characteristics and inclination values with, however, a clear indication that the different sub-sets of orbital characteristics would be mutually exclusive; in other terms, frequency assignments to the satellite system would be operated on one of the sub-sets of orbital parameters to be determined at the notification and recording stage of the satellite system at the latest.”*

¹ Except comments submitted in accordance with §§4.1.7, 4.1.9, 4.1.10 of Article 4 of Appendix **30** and **30A** with respect to additional uses under Article 4 and use of the guardbands under Article 2A of Appendix **30** and **30A** those Appendices in Region 1 and Region 3.

2 Receipt of notices

It is incumbent on all administrations to meet deadlines established in the Radio Regulations and, accordingly, to take account of possible mail delays, holidays or periods during which ITU may be closed².

Having regard to the electronic submissions of notices and various means available for transmission and delivery of notices and other of related correspondence, the Board has decided that:

2.1 Electronic submissions of notices

- a) Notices submitted using "e-Submission of satellite network filings" for space services or via WISFAT for terrestrial services shall be recorded as received on the actual date of receipt, irrespective of whether or not that is a working day at the ITU/BR's offices in Geneva.
- b) Notices submitted using "e-Submission of satellite network filings" for space services or via WISFAT for terrestrial services do not require any separate confirmation by telefax or mail.
- c) Receipt of notices related to space services shall be acknowledged immediately by ITU/BR e-mail. Receipt of notices related to terrestrial services is acknowledged immediately by a message sent by WISFAT automatically.

2.2 Correspondence related to submission of notices

- a) Mail received through the postal service³ shall be recorded as received on the first working day on which it is delivered to the ITU/BR's offices in Geneva. Where the mail is subject to a regulatory time limit that occurs on a date on which the ITU is closed, the mail should be accepted if it has been recorded as received on the first working day following the period of closure.
- b) E-mail, ~~and telefax documents or WISFAT submissions~~ shall be recorded as received on the actual date of receipt, irrespective of whether or not that is a working day at the ITU/BR's offices in Geneva.
- c) ~~In the case of e-mails (except those to which electronic forms created using SpaceCom are attached), an administration is required to send, within 7 days of the date of the e-mail, a confirmation by either telefax or mail, which shall be regarded as being received on the same date as the original e-mail.~~
- d) All mail must be sent to the following address:

Radiocommunication Bureau
International Telecommunication Union
Place des Nations
CH-1211 Geneva 20
Switzerland

- e) All telefaxes must be sent to:
+41 22 730 57 85 (several lines)
- f) All e-mails must be sent to:
brmail@itu.int
- g) Information received in the ITU/BR by e-mail shall be acknowledged immediately by e-mail by the ITU/BR.

NOC

² The Radiocommunication Bureau shall inform administrations by circular letter at the beginning of each year, and as appropriate, about holidays or periods in which ITU may be closed in order to assist them in meeting their obligations.

³ Includes courier, messenger or other services.

3 Establishment of a formal date of receipt of information in accordance with Annex 2 to Appendix 4

NOC

4 Other non-receivable submissions

***Reasons:** The proposed changes to this Rule of Procedure reflect the latest developments in the processing of submissions of space and terrestrial notices and treatment of the related correspondence.*

*With respect to space services, in accordance with Resolutions **907 (WRC-15)** and **908 (Rev.WRC-15)**, an online application “e-Submission of Satellite Network Filings” has been developed to allow administrations to submit their satellite network filings or their comments related to a BR IFIC through an online interface without the need for emails or faxes. This online application encompasses all types of submissions related to satellite networks or systems. After a trial period, this modification mandates the use of the online application for formal submissions of satellite networks and comments to IFIC as of 1st August 2018.*

With respect to terrestrial services, the currently used tool for creating and validating notices TerRaNotices, as well as terrestrial online validation software are added to this Rule of Procedure for the sake of completeness.

The provisions, which are similar for space and terrestrial services, have been combined in Section 2. The mandatory confirmation of e-mail correspondence by a fax or mail within 7 days (Section 2.2 c)) has been deleted, since it is not used any longer.

Effective date of application of the Rule: 1st August 2018.

ANNEX 3
Rules concerning
ARTICLE 9 of the RR

TABLE 9.11A-1

Applicability of the provisions of Nos. 9.11A-9.15 to stations of space services

MOD

TABLE 9.11A-1 (continued)

1	2	3	4	5	6	7
Frequency band (MHz)	Footnote No. in Article 5	Space services mentioned in a footnote referring to Nos. 9.11A, 9.12, 9.12A, 9.13 or 9.14 , as appropriate	Other space services or systems to which Nos. 9.12 to 9.14 provisions(s) apply equally, as appropriate	Applicable Nos. 9.12 to 9.14 provision(s), as appropriate	Terrestrial services in respect of which No. 9.14 apply equally	Notes
6 700-7 075	5.458B	FIXED-SATELLITE (limited to non-GSO MOBILE-SATELLITE SERVICE feeder links)	↓	FIXED-SATELLITE (<u>non-GSO</u>) in bands 6 700-6 725 MHz and 7 025-7 075 MHz (see also No. 5.441 for the bands 6 725-7 025 MHz)	↑	9.12, 9.12A, 9.13

Reasons: To resolve inconsistency between the current Rule of Procedure and No. **22.5A** in view of No. **9.6.3**. This inconsistency seems to have been overlooked when the Rule of Procedure was modified by the 73th meeting of the RRB (17-21 October 2016), as a consequence of the suppression of No. **5.458C** by WRC-15.

Effective date of application of the Rule: 1st January 2017 (The Radiocommunication Bureau will publish a modification to all coordination requests for which coordination requirements have been identified as a result of the application of the modified Rule of Procedure adopted in October 2016. No notification have been affected by this modified Rule of Procedure).

ANNEX 4
Rules concerning
ARTICLE 9 of the RR

MOD**9.27****1 Frequency assignments to be taken into account in the coordination procedure**

Frequency assignments to be taken into account in the coordination procedure are mentioned in § 1 to 5 of Appendix 5 (see also Rules of Procedure concerning No. 9.36 and Appendix 5).

1.1 The period between the date of receipt by the Bureau of relevant information under No. **9.1A** or **9.2** for a satellite network and the date of bringing into use of the assignments of the satellite network in question shall in no circumstance exceed seven years as referred to in No. **11.44**. Consequently, frequency assignments not complying with these time-limits will no longer be taken into account under the provisions of No. **9.27** and Appendix 5. (See also Nos. **11.43A**, **11.48**, Resolution **49 (Rev.WRC-15)** and Resolution **552 (WRC-15)**.)

Reasons: Editorial change consequential to WRC-15 decision to suppress the submission of API for satellite systems that are subject to coordination procedure.

*Effective date of application of the Rule: 1st January 2017 (the Bureau is already applying this Rule as modified in accordance with No. **11.44**, as revised by WRC-15).*

2 Modification of characteristics of a satellite network during coordination

2.1 After an administration informs the Bureau of a modification of characteristics of its network, it is essential to establish its proper coordination requirements with respect to other administrations, i.e. with which administration(s), and for which of their network(s), the modified part of the network needs to effect coordination before it can be notified for recording.

2.2 The guiding principles for dealing with modifications are:

- general obligation to effect coordination before notification (No. **9.6**), and
- the fact that coordination is not required when the nature of the change is such as not to increase the interference to or from, as the case may be, the assignments of another administration, as specified in Appendix 5.

2.3 Based on these principles, and provided that the appropriate coordination trigger limit is exceeded, the modified part of the network will need to effect coordination with respect to space networks that are to be taken into account for coordination:

- a) networks with “2D-Date”² before D1³;
- b) networks with “2D-Date” between D1 and D2⁴, where the nature of the change is such as to increase the interference to or from, as the case may be, the assignments of these networks. In case of GSO

² The “2D-Date” is the date from which an assignment is taken into account as defined in § 1 e) of Appendix 5.

³ D1 is the original “2D-Date” of the network undergoing modification.

⁴ D2 is the date of receipt of request for modification. Concerning the date of receipt, see the Rule of Procedure on Receivability.

networks referred to in No. **9.7**, including those to which the coordination arc approach has been applied (see No. **9.7** of Table 5-1 of Appendix **5**), the increase of interference will be measured in terms of $\overline{T/T}$, or pfd values when Resolution **553 (WRC-15)** or Resolution **554 (WRC-12)** apply. In case of non-GSO networks referred to in No. **9.7B**, the increase of interference will be measured in terms of a cumulative distribution function of equivalent power-flux density (epfd) produced to these earth stations.

Reasons: Clarification of the applicable methodology for the case of No. **9.7B** based on the coordination trigger contained in Appendix **5** for this provision.

Effective date of application of the Rule: immediately after approval.

2.3.1 Where the coordination requirements of the modification involve any network under *b*) above, the modified assignments will have D2 as their “2D-Date”. Otherwise, they will retain D1 as their “2D-Date”.

2.3.2 In case of successive modifications of the same part of the network, if the next modification (compared with the previous modification) does not increase the interference to or from a particular network not included in the coordination requirements under *b*) above, that particular network will not be included in the coordination requirements of that next modification.

2.3.3 If it is not possible to verify that there is no increase of interference (e.g. in the absence of appropriate criteria or calculation methods), the “2D-Date” of the modified assignments will be D2.

2.4 When the frequency assignments of non-GSO networks or systems are subject to epfd limits contained in Nos. **22.5C**, **22.5D** and **22.5F**, and/or to coordination under No. **9.7B**, administrations may wish to modify previously submitted data required for Article **22** examination¹. As the modified parameters are not used for coordination between non-GSO networks or systems, the modified frequency assignments will retain D1 as their “2D-Date” provided that:

- a) the previous assignments received favourable findings under No. **11.31** with respect to Article **22**;
- b) the modified assignments received a favourable finding under No. **11.31** with respect to Article **22** using the latest version of the epfd validation software;
- c) the modified assignments, in case that they are subject to No. **9.7B**, retain D1 as their “2D-Date” in accordance with §§ 2.3 to 2.3.3 above.

Reasons: Taking into account the fact that Recommendation ITU-R S.1503 and the associated software will continue to evolve in parallel with the development of non-GSO FSS systems they are intended to model, it may be appropriate for revised pfd and e.i.r.p. mask data to be submitted for examination. If a new version of Recommendation ITU-R S.1503 and new software tools become available, and if a favourable finding under RR Article **22** has already been given but a notifying administration nevertheless elects to provide updated pfd and e.i.r.p. mask data, the non-GSO system for which the updated data is provided should not receive a new date of protection since these parameters are used for interference evaluation with respect to GSO networks only and not used for coordination between non-GSO systems.

Effective date of application of the Rule: immediately after approval.

2.45 After having examined the modified network as described in § 2.3 and § 2.4 above, the Bureau shall publish the modification, including its coordination requirements, in the appropriate Special Section for comments by administrations within the usual 4-month period. Initial characteristics are thus replaced by

¹ Limited to the elements listed under A.14, A.4.b.6.a and A.4.b.7 of RR Appendix **4**.

the published modified characteristics, and only the latter will be taken into account in subsequent applications of No. 9.36.

NOC

3 Modification to characteristics of an earth station

ANNEX 5
Rules concerning
ARTICLE 11 of the RR

11.48

Note: WRC-15 took the decision related to RR No. **11.48** during the 8th Plenary, Par. 1.39 to 1.42 of Doc. CMR15/505, Approval of Doc. CMR15/416 in relation to Section 2.2.2, as follows:

*“WRC-15 noted the inconsistency between RR No. **11.48** and § 8 of Annex 1 to Resolution **552 (WRC-12)*** and confirmed its understanding that frequency assignments of satellite networks operating in the 21.4-22 GHz band shall be cancelled by the Bureau 30 days after the end of the seven-year period following the date of receipt by the Bureau of the relevant complete information under RR No. **9.1** or **9.2**, as appropriate, and after the end of the three-year period following the date of suspension under RR No. **11.49****.”*

ADD

Actions from the Bureau following a Board decision to grant an extension for bringing into use frequency assignments to a satellite network

When the Board decides to grant an extension of the regulatory time limit for bringing into use frequency assignments to a satellite network in cases of *force majeure* or co-passenger delay, this raises the question of whether the deadline for the submission of Resolution **49(Rev.WRC-15)** and notification information should also be extended. Indeed, No. **11.48** does not only relate to the bringing into use, but also requires that the Radiocommunication Bureau receives the first notice for recording of the frequency assignments under No. **11.15** and the due diligence information under Resolution **49(Rev.WRC-15)** before the end of the 7-year regulatory period.

Unless explicitly decided otherwise by the Board, an extension of the date of bringing into use of frequency assignments to a satellite network does not imply an extension of the regulatory deadline for submitting the notification and Resolution **49(Rev.WRC-15)** information under No. **11.48**, because such information about the planned frequency usage and coordination status would be useful to other administrations in the planning of their satellite projects and their coordination activities. Consequently, in cases where this information has not been provided before the decision of the Board to grant an extension of the deadline for bringing into use, the Bureau will inform the notifying administration after the Board decision that it still has to provide, within the 7-year period and in accordance with No. **11.48**, the notification and Resolution **49(Rev.WRC-15)** information pertaining to the satellite that faced a case of *force majeure* or a co-passenger delay. In order to ensure that the information is relevant and accurate, the notifying administration shall update the information contained in Annex 2 to Resolution **49(Rev.WRC-15)** when it becomes available, but before the end of the extended period of bringing into use, on the basis of the characteristics of the satellite that will actually bring into use the concerned frequency assignments.

Reasons: *to clarify the default procedure to be followed when the Board decides to grant an extension of the regulatory time limit for bringing into use frequency assignments to a satellite network. The request to provide*

* *Note by the Secretariat:* This Resolution was revised by WRC-15.

** *Note by the Secretariat:* WRC-15 further amended the provisions of No. **11.49**. As a consequence, the “three-year period following the date of suspension” is understood to refer to the end of the maximum period of suspension under No. **11.49**.

*Resolution **49(Rev.WRC-15)** information about the satellite that faced a case of force majeure or a co-passenger delay is inspired by the similar procedure contained in § 4.1.3bis of Appendices **30** and **30A**.*

Effective date of application of the Rule: immediately after approval.

ANNEX 6

Rules concerning

APPENDIX 30 to the RR

Notification, examination and recording

Art.5

SUP

5.2.2.2

***Reasons:** The content of this Rule of Procedure has been included in the Radio Regulations as § 5.2.2.3 of Article 5 of Appendix **30**.*

Rules concerning

APPENDIX 30A to the RR

Notification, examination and recording

Art.5

SUP

5.2.2.2

***Reasons:** The content of this Rule of Procedure has been included in the Radio Regulations as § 5.2.2.3 of Article 5 of Appendix **30A**.*

ANNEX 7

PART A10

**Rules concerning the Regional Agreement relating to the planning of
the digital terrestrial broadcasting service in parts of Regions 1 and 3, in the frequency bands
174-230 MHz and 470-862 MHz
(Geneva, 2006) (GE06)**

Annex 4

**Section I: Limits and methodology for determining when agreement
with another administration is required**

NOC

5.2.2

ADD

Appendix 1 to Section I

A Coordination trigger field strengths for the protection of the broadcasting and other primary services from a modification to the Plan

A.2 Coordination trigger field strengths to protect the mobile service in the bands 174-230 MHz and 470-862 MHz

Table A.1.3 of this Section contains the system type codes for mobile service systems and their corresponding coordination trigger field-strength values to protect from DVB-T. These coordination triggers cannot be applied to the IMT-2000 and IMT-Advanced stations, since the specific systems listed in the Table do not belong to the IMT “family” of standards. As for a generic code ‘NB’ contained in the Table, it cannot be used for IMT systems, pursuant to Resolutions **749 (Rev.WRC-15)** and **760 (WRC-15)**.

In view of the above, the Board decided that, when submitting frequency assignments to stations of IMT-2000 and IMT-Advanced systems, e.g. LTE and LTE-Advanced, in the band 470 – 862 MHz for the application of the GE06 coordination procedure and notification to the Master Register, administrations shall use the system type code ‘ND’.

The coordination trigger field strengths corresponding to this code are calculated by the Bureau using the notified technical characteristics and equation (2) from Recommendation ITU-R M. 1767-0, as follows:

$$F_{trigger} = -37 + F - G_i + L_F + 10 \log (B_i) + P_o + 20 \log f + I / N - K$$

where:

- F: receiver noise figure of the mobile service base or mobile station receivers (dB)
- B_i: the bandwidth of a terrestrial broadcasting station (MHz)
- G_i: the receiver antenna gain of the station in the mobile service (dBi)
- L_F: antenna cable feeder loss (dB)

- f: centre frequency of the interfering station (MHz)
 P_o: man-made noise (dB) (typical value is 0 dB for the UHF band)
 I/N: interference to noise ratio
 K: overlap correction factor, calculated as shown in Attachment to Appendix 4.2 of the GE06 Agreement (Tables AT.4.2-4 and AT.4.2-5), where the overlapped bandwidth B_o is calculated as follows:

$$B_o = \text{Min} (B_i, B_v, (B_v + B_i)/2 - |\Delta f|)$$

where:

B_v: the bandwidth of the receiving station in the mobile service

Δf: the difference between the centre frequency of the mobile service system and the centre frequency of the interfering (DVB-T) signal.

The parameters to be applied in the equation are listed below. They are derived from Report ITU-R M.2039-3 for IMT-2000 and Report ITU-R M.2292-0 for IMT-Advanced systems.

Parameters	Receiving base station (ML)	Receiving mobile station (FB)
f (centre frequency, MHz)	470-862	
F (receiver noise figure, dB)	5	9
G _i (receiver antenna gain, dBi)	15	-3
L _F (antenna cable feeder loss, dB)	3	0
P _o (man-made noise, dB)	0	0
F – G _i + L _F + P _o	-7	12
I/N (interference to noise ratio, dB)	-6	
B _i (bandwidth of TV station, MHz)	8	

The above parameters apply to stations operating on frequency 790 MHz. For other frequencies in the UHF band, the interpolation should be made by adding a correction factor of 10 log (f/790).

As indicative of the resulting values, the trigger field strengths of an IMT station operating on 790 MHz are equal to 17 (dB(μV/m) for receiving base station and 36 (dB(μV/m) for receiving mobile station, when the K factor is 0, i.e. when the IMT station uses the bandwidth less than or equal to 8MHz.

For establishing coordination contours, the heights of receiving antennas of base and mobile stations are assumed to be 30 m and 1.5 m respectively.

Reasons: System type code is a mandatory data item for the notification of assignments to the stations of the other primary services (OPS) in the GE06 planning area and frequency bands. It determines the protection requirements of an OPS station and is used for construction of coordination contours and identification of affected administrations.

The available system type codes, contained in Table A.1.3, were developed in 2004 – 2006 and based on the specific systems that had been communicated to the Intersessional Planning Group. Only two system type codes given in the Table could be utilized for digital cellular mobile systems, i.e. codes 'NA' and 'NB'. However, neither of these codes can be applied to IMT-2000 and IMT-Advanced systems for the following reasons:

- code 'NA' is limited to a specific digital land mobile system with 3 MHz or 5 MHz bandwidth, other than IMT. In addition, it contains a coordination trigger for base stations only. The trigger for mobile stations is missing, which makes code 'NA' unusable for notification of mobile stations;

- generic code 'NB' cannot be applied to the IMT systems, pursuant to Resolutions **749 (Rev.WRC-15)** and **760 (WRC-15)**, which limit the usage of this code to the mobile systems with a bandwidth of 25 kHz. In addition, the typical characteristics of mobile systems contained in the GE06 Agreement and used for calculation of coordination triggers do not correspond to the characteristics of IMT-2000 and IMT-Advanced systems listed in Reports ITU-R M.2039 and M.2292.

Consequently, it is proposed to introduce new system type code 'ND' to ensure adequate protection of IMT-2000 and IMT-Advanced stations, notably LTE and LTE-A, operating in the GE06 planning area and frequency bands.

Administrations are intended to submit this system type code for the application of the GE06 coordination procedure and notification of the relevant assignments to the Master Register. Based on this code 'ND' and notified characteristics, the Bureau will calculate the relevant coordination trigger field-strength values, necessary for establishing coordination contours and determining affected administrations in Section I of Annex 4 of the GE06 Agreement.

Effective date of application of the modified Rule: immediately after its approval.

ANNEX 8

PART B

SECTION B3

**Rules concerning methodology for calculation of probability
of harmful interference between satellite networks (*C/I* ratios)**

NOC

1 Introduction

NOC

2 Probability of harmful interference

MOD

3 Methodology

To perform the above-mentioned compatibility analysis the following methodology will be used.

The methodology is based on Recommendation ITU-R S.741-2. A set of carrier-to-interference (*C/I*) calculations, using power values submitted by notifying administrations in items C.8.a.1/C.8.b.1 (i.e. the maximum value of the peak envelope power/the total peak envelope power) of Appendix 4 for both wanted and interference carrier levels, are performed following the geometrical considerations of Recommendation ITU-R S.740 and an interference adjustment factor is calculated as shown below to take into consideration the frequency offset situations as well as the difference in the bandwidths between the wanted and the interfering carriers. These *C/I* values are then compared with the required *C/I* values derived from the criteria appearing in Table 2 of § 3.2 below which contains a set of single entry interference criteria to protect different types of carriers. In the case of required *C/I* values agreed by administrations and communicated to the Bureau, the calculated *C/I* values will be compared with these mutually agreed *C/I* values.

Thereafter, a set of margins *M* (*C/I* calculated – *C/I* required) are derived. It should be noted that to evaluate the *C/I* required, a set of carrier-to-noise ratio (*C/N*) objectives are used (performance) and a *K* value, generally of either 12.2 or 14.0 dB, is added in accordance with the above-mentioned Table 2 of § 3.2 below. It should also be noted that these values correspond to a maximum permissible interference of 6% or 4% of the total noise power *N* of the protected assignments (performance).

In order to identify *C/I* required to be used for calculations, two scenarios are analyzed:

- I. The assessment of interference caused by incumbent networks into the network submitted for the examination under No. **11.32A**:

In this case, to calculate the required C/I of the examined network, the C/N objective of the network (see item C.8.e.1 of Annex 2 of Appendix 4) submitted by the notifying administration for examination under No. **11.32A** is used.

II. The assessment of interference caused by the network submitted for examination under No. **11.32A** into incumbent networks:

In this case, to calculate the required C/I of each of the incumbent networks, the lower value between the submitted C/N objective (see item C.8.e.1 of Annex 2 of Appendix 4) and the calculated C/N (using power values submitted by the notifying administration in items C.8.a.1/C.8.b.1 of Appendix 4) of the incumbent network is used.

If no C/N objectives are submitted by notifying administrations (since this was not required in the past), the calculated C/N values are used.

In respect of C/N ratio calculations used to define single entry protection criteria (C/I required), Table 2 of Recommendation ITU-R S.741-2 (see below) defines " C/N_{tot} " as a "ratio (dB) of carrier to total noise power which includes all internal system noise and interference from other systems". Therefore, and to comply with this definition, an additional margin of 0.46 dB for cases involving wanted analogue TV emissions and 1.87 dB for other wanted emissions ~~will be~~ should be added to the margins calculated on the basis of the internal system noise values provided by the concerned administrations if the submitted C/N objective does not include a margin for inter-system interference. Attachment 2 contains the calculation methodology used for deriving the above-mentioned additional margin.

For the identification of the C/I required with respect to networks received on and after 1 January 2005, whenever the submitted C/N objective is used to define the C/I required, no additional margins should be added since, following a revision of Appendix 4 by WRC-03, the C/N objective submitted after this date should include a margin for inter-system interference. Whenever the C/N objective received after this date is used in comparison with the C/N calculated as indicated in Scenario II above, additional margins should be added to the value of the C/N calculated.

Reasons: WRC-03 amended item C.8.e.1 of Annex 2 of Appendix 4 and defined it as the greater of either the carrier-to-noise ratio, required to meet the performance of the link under clear-sky conditions or the carrier-to-noise ratio, required to meet the short-time objectives of the link inclusive of the necessary margins. In the French text a comma exists before "inclusive of necessary margins". Therefore, the submitted value of the C/N objective should include all necessary margins.

Prior to WRC-03, no indication of an inclusion of any additional margin into the C/N objective existed in the Radio Regulations. Therefore, the calculation methodology in Attachment 2 is used to define an additional margin to be added to the noise of the C/N objective to identify the C/I required to calculate the probability of causing harmful interference to frequency assignments of the networks received before 1 January 2005.

Effective date of application of the Rule: immediately after approval.

NOC

3.1 Interfering cases

MOD

3.2 Margin M , C/I , C/N algorithms

The algorithms described in Attachment 1 shall be used to evaluate compliance with the mutually accepted interference criteria or with the single entry limits established in Table 2.

Table 2 provided below takes into account the information submitted to the Bureau by administrations in accordance with Appendix 4 and the carrier type definition in § 3.1 above and is a simplification of Table 2 of Recommendation ITU-R S.741-2.

TABLE 2

Single entry interference (SEI) protection criteria

Interfering carrier type Desired carrier type	Analogue (TV-FM) or other	Digital	Analogue (other than TV-FM)
Analogue (TV-FM)	$C/N_{tot} + 14$ (dB)		
Digital	If $DeNeBd \leq InEqBd$ then $C/N_{tot} + 9.4 + 3.5 \log(\delta) - 6 \log(i/10)$ (dB) (i.e. $C/N_{tot} + 5.5 + 3.5 \log(DeNeBd \text{ (MHz)})$) Otherwise if $DeNeBd > InEqBd$ then $C/N_{tot} + 12.2$ (dB)	$C/N_{tot} + 12.2$ (dB)	
Analogue (other than TV-FM)	$13.5 + 2 \log(\delta) - 3 \log(i/10)$ (dB) (i.e. $11.4 + 2 \log(DeNeBd \text{ (MHz)})$)	$C/N_{tot} + 12.2$ (dB)	
Other	$13.5 + 2 \log(\delta) - 3 \log(i/10)$ (dB) (i.e. $11.4 + 2 \log(DeNeBd \text{ (MHz)})$)	$C/N_{tot} + 14$ (dB)	

where:

C/N_{tot} : ratio (dB) of carrier to total noise power which includes all internal system noise and interference from other systems, related to C/N_i internal as follows:

$$\frac{\left(\frac{C}{N_{tot}}\right) - \left(\frac{C}{N_i}\right) - X}{\left(\frac{C}{N_{tot}}\right)} = \left(\frac{C}{N_i}\right) - X$$

where X is the value of additional margin defined in Attachment 2, Sections 3 to 5 and C/N_i is based on internal system noise power and defined in Attachment 1, Section 3.

Reasons: Subsequent to the changes proposed in Section 3 above and Attachment 1 below.

Effective date of application of the Rule: immediately after approval.

DeNeBd: necessary bandwidth of desired carrier (Appendix 4, Annex 2, item C.7.a)

InEqBd: equivalent bandwidth of interfering carrier (equal to total power to power density ratio (see Appendix 4, Annex 2, items C.8.a.1 and C.8.a.2 respectively))

δ : ratio of desired signal bandwidth to peak-to-peak deviation of the TV carrier caused by the energy dispersal signal (a peak-to-peak deviation of 4 MHz is used in all cases)

i : pre-demodulation interference power in the desired signal bandwidth expressed as a percentage of the total pre-demodulation noise power (a value of 20 is used in all cases).

NOC

3.3 Single channel per carrier (SCPC) cases

NOC

3.4 Interference between analogue FDM-FM signals (Case (IX) in Table 1 above)

NOC

3.5 Other interference cases

ATTACHMENT 1

Calculation algorithms (M , C/I , C/N)

MOD

1 Margin algorithm

To compute the margins, it is necessary first to determine the required $\left(\frac{C}{I}\right)_m$ value, which is a function of the C/N and the K factor:

$$\frac{\left(\frac{C}{I}\right)_m - \left(\frac{C}{N_i}\right) + K - X}{\left(\frac{C}{I}\right)_m} = \left(\frac{C}{N_i}\right) + K - X$$

$$\left(\frac{C}{I}\right)_m = \left(\frac{C}{N_{tot}}\right) + K$$

where:

$\left(\frac{C}{I}\right)_m$: required C/I value (dB)

$\frac{\left(\frac{C}{N_i}\right)}{\left(\frac{C}{N_{tot}}\right)}$: ratio (dB) of carrier to total noise power which includes all internal system noise and interference from other systems
 ~~C/N_i : objective or calculated value of C/N_i (dB) (see § 3 above and section 3 below).~~

- K : factor used in computing the required C/I (dB). Generally, this will be either 14.0 or 12.2, depending on the modulation characteristics of the desired signals (see Recommendations ITU-R S.483 and ITU-R S.523).
- ~~X : Additional margin to comply with the definition of carrier to total noise power which includes all internal system noise and interference from other systems. Attachment 2 contains methodology used for deriving the additional margin.~~

The total carrier-to-noise ratio is defined, as follows:

a) For receiving frequency assignments of a network received before 1 January 2005:

- Scenario I (as defined in Section 3):

$$\left(\frac{C}{N_{tot}} \right) = \left(\frac{C}{N_{obj}} \right) - X$$

- Scenario II:

$$\left(\frac{C}{N_{tot}} \right) = \text{MIN} \left(\frac{C}{N_i}, \frac{C}{N_{obj}} \right) - X$$

b) For receiving frequency assignments of a network received on and after 1 January 2005:

- Scenario I:

$$\left(\frac{C}{N_{tot}} \right) = \left(\frac{C}{N_{obj}} \right)$$

- Scenario II:

$$\left(\frac{C}{N_{tot}} \right) = \text{MIN} \left(\frac{C}{N_i} - X, \frac{C}{N_{obj}} \right)$$

where:

~~X : Additional margin (see Attachment 2, Sections 3 to 5) to comply with the definition of carrier to total noise power, which includes all internal system noise and interference from other systems. Attachment 2 contains the methodology used for deriving the additional margin.~~

C/N_i Calculated value of carrier-to-noise ratio, based on internal system noise power, defined in Section 3 below.

C/N_{obj} C/N objective of the network (see item C.8.e.1 of Annex 2 of Appendix 4) submitted by the notifying administration for examination under No. **11.32A**.

Reasons: *Subsequent to the changes proposed in Section 3 above.*

Effective date of application of the Rule: immediately after approval.

Since $\left(\frac{C}{I}\right)_m$ and $\left(\frac{C}{I}\right)_a$ will vary depending on the geographical location within the service area, both values are computed:

- At the geographical locations of the associated specific earth stations, if any, or,
- In case of associated typical earth stations, at the test point located within the service area where the $\left(\frac{C}{I}\right)_a$ value is minimum in accordance with the method given in Attachment 3.

The margin is the difference between the calculated C/I value and the required C/I value:

$$M = \left(\frac{C}{I}\right)_a - \left(\frac{C}{I}\right)_m$$

where:

M : margin (dB)

$\left(\frac{C}{I}\right)_a$: adjusted value of C/I , taking into account the interference adjustment factor (dB)

$\left(\frac{C}{I}\right)_m$: is the required C/I value (dB) computed above.

Therefore, substituting, we have:

$$M = \left(\frac{C}{I}\right)_a - \left(\frac{C}{N_{tot}}\right) \left(\frac{C}{I}\right)_a - \left(\frac{C}{N}\right) - K$$

NOC

2 The $\left(\frac{C}{I}\right)_a$ algorithm for interfering situations

NOC

3 The C/N algorithm

NOC

ATTACHMENT 2

Additional margins to be taken into consideration

NOC

ATTACHMENT 3

Finding test-points for C/I calculation
