Radio Regulations Board
Geneva, 16– 20 July 2018

Document RRB18-2/14-E
19 July 2018
Original: English

SUMMARY OF DECISIONS OF THE 78TH MEETING OF THE RADIO REGULATIONS BOARD

16 – 20 July 2018

Present: Members, RRB

Mr M. BESSI, Chairman

Ms J. C. WILSON, Vice-Chairman

Mr N. AL HAMMADI, Mr D. Q. HOAN, Mr Y. ITO, Ms L. JEANTY, Mr I. KHAIROV, Mr S. K. KIBE, Mr S. KOFFI, Mr A. MAGENTA, Mr V. STRELETS, Mr R. L. TERÁN

Executive Secretary, RRB
Mr F. RANCY, Director, BR

Précis-Writers
Mr T. ELDRIDGE and Ms C. RAMAGE

Also present: Mr H. ZHAO, Secretary-General
Mr A. VALLET, Chief, SSD
Mr M. SAKAMOTO, Head, SSD/SSC
Mr J. WANG, Head, SSD/SNP
Mr C.C. LOO, Head, SSD/SPR
Mr N. VASSILIEV, Chief, TSD
Ms I. GHAZI, Head, TSD/BCD
Mr K. BOGENS, Head TSD/FMD
Mr S. JALAYERIAN, acting Head, TSD/TPR
Mr D. BOTHA, SGD
Ms K. GOZAL, Administrative Secretary

Item No.	Subject	Action/decision and reasons	Follow-up
1	Opening of the meeting	The Chairman, Mr M. BESSI, welcomed the members of the Board to the 78th meeting. The Secretary-General, Mr H. ZHAO, also welcomed the members of the Board to the meeting and highlighted a number of issues to be addressed by the Board. He further encouraged the members of the Board to participate in regional meetings to assist their administrations in the preparations of WRC-19 and wished the Board a very successful meeting.	-
2	Adoption of the agenda (RRB18-2/OJ/1(Rev.2))	The draft agenda was adopted with modifications as provided in Document RRB18-2/OJ/1(Rev.2). The Board agreed to include Documents RRB18-2/DELAYED/1 under agenda item 3, RRB18-2/DELAYED/2 under agenda item 5.2, RRB18-2/DELAYED/3 under agenda item 6.1 and RRB18-2/DELAYED/4, RRB18-2/DELAYED/5 and RRB18-2/DELAYED/6 under agenda item 7.1 for information.	-
3	Report by the Director, BR (RRB18-2/2; RRB18-2/2(Add.1); RRB18-2/2(Add.2); RRB18-2/2(Add.3); RRB18-2/2(Add.4); RRB18-2/2(Add.5); RRB18-2/DELAYED/1)	The Board considered in detail the Report of the Director of the Radiocommunication Bureau, as contained in Document RRB18-2/2 and its addenda, and thanked the Bureau for the extensive and detailed information provided.	-
		a) In relation to §2 of Document RRB18-2/2, the Board noted with appreciation the efforts from the Bureau resulting in reductions in the treatment time of filings for satellite networks in certain cases, but was concerned that further improvement would be required overall, particularly in the case of treatment of filings under Appendix **30B**. The Board decided to instruct the Bureau to continue: • efforts to reduce the delays and to observe the regulatory deadlines for the processing of filings for satellite networks; • consulting administrations on the significant impact on the processing time for complex and extensive satellite network filings, and to invite them to comply with the provisions of No. **4.1** of the	Bureau to continue to reduce delays, to continue consulting administrations on the impact on processing time for complex and extensive satellite networks and continue assisting administrations in the use of the software for

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		Radio Regulations when they notify the frequency requirements for their satellite networks; • assisting administrations in the use of the new application "e-Submission of Satellite Network Filings" developed in response to Resolution **908 (Rev.WRC-15)** for the submission of electronic filings for satellite networks.	submission of satellite network filings.
		b) In considering §4.2 of Document RRB18-2/2 and Addenda 1, 3, 4 and 5, the Board noted with satisfaction the efforts made by the Administration of Italy to organize bilateral and multilateral meetings for the resolution of harmful interference cases of sound broadcasting stations and the improvement of the situation on harmful interference with France and Malta. However, the Board noted with concern that the situation with Croatia, Slovenia and Switzerland has not improved. The Board encouraged the Administration of Italy and its neighbouring administrations to continue to coordinate in bilateral and multilateral meetings, including the broadcasting operators in such meetings when appropriate, to resolve cases of continuing harmful interference to sound and television broadcasting stations, and to focus efforts on those stations identified in the priority lists. Furthermore, the Board requested the Administration of Italy to observe the digital sound broadcasting Plan of the GE06 Regional Agreement. The Board decided to instruct the Bureau to produce a document, coordinated with countries concerned, on the basis of priority lists, contributions from administrations and the road map from Italy, that would indicate the status of stations causing harmful interference, those being interfered with, and the progress achieved, and encouraged the administrations concerned to provide the Bureau with information in a timely manner to update this document on a continuous basis and to submit the updated document to future meetings of the Board.	Bureau to produce document on status of interfering and interfered-with stations and progress achieved.

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		c) When considering §6 of Document RRB18-2/2, the Board noted Decision 482 of Council 2018 on cost recovery for satellite network filings and the decision to create a Council Expert Group which is to study the matter further. The Board decided to instruct the Bureau to report to the Board on progress on this matter.	Bureau to report on progress on this matter.
		d) The Board noted the items in § 7.1 on the publication of reviewed findings and § 7.2 on the harmonisation of input data of Document RRB18-2/2 and decided to instruct the Bureau to make all efforts to expedite the acquisition of new software for the processing of filings under Resolution **85 (WRC-03)** and to report to the Board on progress on this matter.	Bureau to report on progress on the acquisition of software for the processing of filings under Res. **85 (WRC-03).**
		e) The Board noted the actions of the Bureau under §8 and §9 of Document RRB18-2/2 and considered that the Bureau had acted appropriately. The Board welcomed the decision of the Bureau to send reminders to administrations on the deadline for the submission of extension requests for satellite networks that would reach the expiry of the 15 year period of operation in accordance with § 4.1.24 of Appendices **30** and **30A**. The Board decided to instruct the Bureau to continue with this practice and to report to WRC-19 on the possible need to revise § 4.1.24 of Appendices **30** and **30A** accordingly.	Director to report to WRC-19 on the possible need to revise § 4.1.24 of Appendices **30** and **30A**.
		f) The Board considered Addendum 2 to Document RRB18-2/2 in detail and also considered Document RRB18-2/DELAYED/1 for information. The Board noted that the Administration of Cyprus had made all efforts to comply with the provisions of the Radio Regulations and further noted that the national allotment of Ukraine (UKR00001) may not be identified as affected by the resubmitted KYPROS-SAT-3 satellite network. After thorough examination of all the information provided, the Board concluded that it was not able to accede to the requests from the Administration of Cyprus. However, the Board decided to instruct the Bureau to continue to process the filings for the KYPROS-SAT-3	Executive Secretary to communicate these decisions to the administration concerned. Bureau to continue to process the filings for the KYPROS-SAT-3 satellite network and take into account its

Item No.	Subject	Action/decision and reasons	Follow-up
		satellite network, and take into account its frequency assignments, until the last day of WRC-19 and to report the case to WRC-19 for a decision.	frequency assignments until the last day of WRC-19. Director to report the case to WRC-19
4	Rules of procedure	-	-
4.1	List of rules of procedure (RRB18-2/1; RRB16-2/3(Rev.8))	The Board decided to update the list of proposed rules of procedure in Document RRB18-2/1 (RRB16-2/3(Rev.8)) taking into account the approval of new or revised rules of procedure.	Executive Secretary to publish the updated list of proposed rules of procedure on the website.
4.2	Draft rules of procedure (CCRR/60)	The Board discussed in detail the draft rules of procedure circulated to administrations in Circular Letter CCRR/60, along with comments received from administrations as contained in Document RRB18-2/8(Rev.1). The Board adopted the rules of procedure with modifications as contained in Annexes 1-8 to this summary of decisions.	Executive Secretary to update and publish the Rules of Procedure accordingly.
4.3	Comments from administrations (RRB18-2/8(Rev.1))		
5	Requests relating to cancellations of the frequency assignments to satellite networks under No. **13.6** of the Radio Regulations	-	-

Item No.	Subject	Action/decision and reasons	Follow-up
5.1	Request for a decision by the Radio Regulations Board for the cancellation of the frequency assignments in the bands 10 950-11 195 MHz and 11 197.98-11 198.03 MHz to the INTELSAT8 328.5E and INTELSAT9 328.5E satellite networks under No. **13.6** of the Radio Regulations (RRB18-2/5) Submission by the Administration of the United States regarding the frequency assignments in the bands 10 950-11 195 MHz and 11 197.98-11 198.03 MHz to the INTELSAT8 328.5E and INTELSAT9 328.5E satellite networks at 31.5°W (RRB18-2/13)	The Board considered in detail Documents RRB18-2/5 and RRB18-2/13 and concluded that the Bureau had applied No. **13.6** of the Radio Regulations correctly. The Board noted that the Administration of the United States provided no information to demonstrate that the frequency assignments continued to be in use in compliance with the provisions of the Radio Regulations for the three year period prior to 26 September 2017. However, the Board further noted that the frequency assignments are among those referenced as "Common Heritage" in the Agreement Relating to the International Telecommunications Satellite Organisation. Based on the information provided, the Board considered that the Administration of the United States did not comply with the Radio Regulations and decided to cancel all assignments to the INTELSAT8 328.5E and INTELSAT9 328.5E satellite networks in the frequency bands 10 950-11 195 MHz and 11 197.98-11 198.03 MHz, and instructed the Bureau to postpone this cancellation until the last day of WRC-19.	Executive Secretary will communicate this decision to the administration concerned. Bureau to cancel all assignments to the INTELSAT8 328.5E and INTELSAT9 328.5E satellite networks in the frequency bands 10 950-11 195 MHz and 11 197.98-11 198.03 MHz and to postpone this cancellation until the last day of WRC-19.
5.2	Request for a decision by the Radio Regulations Board for the cancellation of the frequency assignments to the CTDRS-1-77E satellite network under No. **13.6** of the Radio Regulations (RRB18-2/6)	The Board considered Document RRB18-2/6 in detail. Based on the information provided in Document RRB18-2/9 and Document RRB18-2/DELAYED/2 for information, the Board concluded that the frequency assignments to the CTDRS-1-77E satellite network were in use in compliance with the Radio Regulations, and that the Administration of China has provided information to confirm this status. Consequently, the Board decided to instruct the Bureau to maintain the frequency assignments to the CTDRS-1-77E satellite network in the MIFR.	Executive Secretary will communicate these decisions to the administration concerned.

Item No.	Subject	Action/decision and reasons	Follow-up
	Submission by the Administration of China regarding the status of the frequency assignments to the CTDRS-1-77E satellite network (RRB18-2/9; RRB18-2/DELAYED/2)		
5.3	Request for a decision by the Radio Regulations Board for the cancellation of the frequency assignments to the COMS-116.2E and COMS-128.2E satellite networks under No. **13.6** of the Radio Regulations (RRB18-2/7)	The Board considered the information provided in Document RRB18-2/7. The Board noted that the Bureau had sent requests in accordance with No. **13.6** of the Radio Regulations to the Administration of the Republic of Korea to provide information demonstrating that the frequency assignments to the COMS-116.2E satellite network and the frequency assignments to the COMS-128.2E satellite network in the bands 1 675.5-1 676.5 MHz, 1 677-1 683 MHz, 2 048.612-2 049.612 MHz, 2 059-2 064.2 MHz, 2 065.84-2 066.84 MHz, 2 224.78-2 225.78 MHz had been brought into use and continued to be in use, followed by two reminder letters, to which no response had been received. Consequently, the Board instructed the Bureau to cancel the frequency assignments to the COMS-116.2E satellite network and the corresponding frequency assignments in the above-specified frequency bands to the COMS-128.2E satellite network.	Executive Secretary will communicate these decisions to the administration concerned. Bureau to cancel the frequency assignments to the COMS-116.2E satellite network and the corresponding frequency assignments in the specified frequency bands to the COMS-128.2E satellite network
6	Status of the INSAT-2(48), INSAT-2M(48), INSAT-2T(48), and INSAT-EK48R satellite networks at 48°E	-	-

Item No.	Subject	Action/decision and reasons	Follow-up
6.1	Submission by the Administration of India on the application of Article **48** of the ITU Constitution to the recorded frequency assignments to the INSAT-2(48), INSAT-2M(48), INSAT-2T(48) and INSAT-EK48R satellite networks at 48°E (RRB18-2/10)	The Board carefully noted Documents RRB18-2/10 and RRB18-2/11 and also considered Document RRB18-2/DELAYED/3 for information. The Board thanked the Administrations of India and Germany for the information provided and noted that the Administration of India has reconfirmed the application of CS Article **48** to the recorded frequency assignments to the INSAT-2(48), INSAT-2M(48), INSAT-2T(48) and INSAT-EK48R satellite networks at 48°E. Furthermore, the Board recognised that it was not within its mandate to make decisions with reference to CS Article **48**. However, the Board draws the attention of administrations when applying CS Article **48** on the need to observe provision 3 of CS Article **48**.	Executive Secretary will communicate this decision to the administrations concerned.
	Submission by the Administration of Germany on the application of Article **48** of the ITU Constitution to the recorded frequency assignments to the INSAT-2(48), INSAT-2M(48), INSAT-2T(48), and INSAT-EK48R satellite networks at 48°E (RRB18-2/11; RRB18-2/DELAYED/3)		
7	Requests for extension of the regulatory time-limit to bring into use frequency assignments	-	
7.1	Submission by the Administration of the Russian Federation requesting an extension of the regulatory time-limit to bring into use the frequency assignments to the ENSAT-23E satellite network (23°E) (RRB18-2/12; RRB18-2/DELAYED/4; RRB18-2/DELAYED/5; RRB18-2/DELAYED/6)	The Board considered the information provided in Document RRB18-2/12 and also considered Documents RRB18-2/DELAYED/4, RRB18-2/DELAYED/5 and RRB18-2/DELAYED/6 for information. Taking due note of the major change introduced by delayed Document RRB18-2/DELAYED/4 and the need for the Bureau and the administrations concerned to analyse the impact of this modification on other satellite networks, the Board decided to defer the consideration of this matter to its 79th meeting in order to allow potentially affected administrations an opportunity to investigate and respond on this matter. The Board instructed the Bureau to publish Document RRB18-2/DELAYED/4 as a contribution to its 79th meeting.	Executive Secretary will communicate this decision to the administrations concerned. Bureau to publish Document RRB18-2/DELAYED/4 as a contribution to the 79th meeting.

Item No.	Subject	Action/decision and reasons	Follow-up
8	Consideration of issues related to Resolution **80 (Rev.WRC-07)**	The Board decided that the Working Group on Resolution **80 (Rev.WRC-07)** would produce a preliminary draft of the report of the RRB to WRC-19 under Resolution **80 (Rev.WRC-07)**, which will be studied at the 79th meeting. The Board instructed the Bureau to take the necessary actions to make the draft report available as a contribution to the 79th meeting. The Board thanked Ms J. WILSON for the outstanding work done on this matter.	Bureau to make draft report available to 79th meeting.
9	Confirmation of the next meeting for 2018, and indicative dates for future meetings	The Board confirmed the dates for the 79th meeting as 26 – 30 November 2018 in Room L and further tentatively confirmed the dates for the first meeting in 2019 as follows: 80th meeting 18 – 22 March 2019. The Board also tentatively confirmed the dates for the other meetings in 2019 as follows: 81st meeting 5 – 12 July 2019 82nd meeting 7 – 11 October 2019	-
10	Any other business		-
11	Approval of the summary of decisions (RRB18-2/14)	The Board approved the summary of decisions as contained in Document RRB18-2/14.	-
12	Closure of the meeting	The meeting closed at 1630 hours on 19 July 2018.	

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 Table of Frequency Allocations and to the provisions listed in the Rules of Procedure on No. **11.31** with regard to the "other provisions". In particular, administrations intending to authorize the use of spectrum under No. **4.4** still have the obligation, under Sections I and II of Article **9**, 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".

1.~~2~~4 Further, ~~It~~ 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 to a transmitting station is capable of causing harmful interference to the stations of another administration operating in accordance with the Radio Regulations does not lie only on the side of the administration operating the transmitting station that may be 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 harmful interference. For this reason, an administration intending to use a frequency assignment to a transmitting station under No. **4.4** has to notify to the Bureau this frequency assignment, pursuant to Article **11**[1], if possible prior to bringing it into use. For space

[1] It is recognised that the exchange of information about the use of frequency assignments, including those under No. **4.4** by stations of terrestrial services in certain bands (e.g. in bands not shared with space services), could also be achieved through bilateral/multilateral arrangements or mechanisms.

services, this includes the prior application of the relevant provisions of Article **9** (see also § 1.3 above).

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**, shall determine:

a) That the intended use of the frequency assignment to the station under No. **4.4** will not cause harmful interference into the stations of other administrations operating in conformity with the Radio Regulations;
b) What measures it would need to take in order to comply with the requirement to immediately eliminate harmful interference pursuant to No. **8.5.**

When notifying the use of frequency assignments to be operated under No. **4.4**, the notifying Administration shall provide a confirmation that it has determined that these frequency assignments meet the conditions referred to above in item a) and that it has identified measures to avoid harmful interference and to immediately eliminate such in case of a complaint.

1.~~3~~7 ~~Similarly and t~~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 the 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.

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*

MOD

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)** ~~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* (**W**eb **I**nterface for **S**ubmission of **F**requency **A**ssignments/allotments) available at https://www.itu.int/ITU-R/go/wisfat/en. It should also be 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

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* **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.

tool is accessible via the ITU website at: https://www.itu.int/ITU-R/terrestrial/OnlineValidation/Login.aspx.

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 closed[2].

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 service[3] 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*~~*c)* All mail must be sent to the following address:

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

~~*e*~~*d)* All telefaxes must be sent to:

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[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.

+41 22 730 57 85 (several lines)

~~f~~*e)* All e-mails must be sent to:

brmail@itu.int

~~g~~*f)* Information received in the ITU/BR by e-mail shall be acknowledged immediately by e-mail by the ITU/BR.

NOC

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

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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 (non-GSO) in bands 6 700-6 725 MHz and 7 025-7 075 MHz ~~(see also No. **5.441** for the bands 6725-7025MHz)~~	↑	**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 D1 [3];

b) networks with "2D-Date" between D1 and D2 [4], 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 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 $\Delta T/T$, 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** examination[4bis]. 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;

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[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.

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

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 2.3.2 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, as appropriate. Initial characteristics are thus replaced by 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.

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* *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**.

If, before the end of the period of extension or within one year following the Board's decision to grant an extension, whichever is earlier, the notifying administration has not provided to the Bureau updated Resolution **49 (Rev. WRC-15)** information for the new satellite under procurement, the related frequency assignments shall lapse. If, one month before the above-mentioned deadline, the notifying administration has not provided to the Bureau updated Resolution **49 (Rev. WRC-15)** information, the Bureau shall promptly send a reminder to the notifying administration.

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 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 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 application of the GE06 coordination procedure and notification for 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 the Attachment to Appendix 4.2 of the GE06 Agreement (Tables AT.4.2-4 and AT.4.2-5), where the overlapped bandwidth *Bo* is calculated as follows:

$$Bo = \text{Min}\,(Bi,\ Bv,\ (Bv + Bi)/2 - |\Delta f|)$$

where:

Bv: 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 systems 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 an indication of the resulting values, the trigger field strengths of an IMT station operating on 790 MHz are equal to 17 dB(μV/m) for a receiving base station and 36 dB(μV/m) for a receiving mobile station, when the K factor is 0, i.e. when the IMT station uses a 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 analys~~z~~ed:

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 unless the submitted C/N objective already includes a margin to account for inter-system interference. Attachment 2 contains the calculation methodology used for deriving the above-mentioned additional margin.

For the identification of the required *C/I* with respect to networks received on or after 1 January 2005, whenever the submitted *C/N* objective is used, no additional margins should be added to the value submitted/provided since, following a revision of Appendix **4** by WRC-03, the *C/N* objective submitted after this date should already include a margin to account for inter-system interference. On the other hand, whenever the calculated *C/N* is used to identify the required *C/I*, as it may be the case according to Scenario II above, the relevant additional margin should be added to the value of the calculated *C/N*.

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 ≤ InEqBd then C/N_{tot} + 9.4 + 3.5 log (δ) – 6 log (i/10) (dB) (i.e. C/N_{tot} + 5.5 + 3.5 log (DeNeBd (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 (δ) – 3 log (i/10) (dB) (i.e. 11.4 + 2 log (DeNeBd (MHz)))	C/N_{tot} + 12.2 (dB)	
Other	13.5 + 2 log (δ) – 3 log (i/10) (dB) (i.e. 11.4 + 2 log (DeNeBd (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:~~

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

~~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:

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

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

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

where:

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

~~$\left(\frac{C}{N_i}\right)$~~ $\left(\frac{C}{N_{tot}}\right)$: ratio (dB) of carrier to total noise power which includes all internal system noise and interference from other systems ~~*C*/*N*$_t$ objective or calculated value of *C*/*N*$_t$ (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):

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

- Scenario II:

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

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

- Scenario I:

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

- Scenario II:

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

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