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| **World Radiocommunication Conference (WRC-15)Geneva, 2-27 November 2015** |  |
| **INTERNATIONAL TELECOMMUNICATION UNION** |  |
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| **PLENARY MEETING** | **Revision 1[[1]](#footnote-1)\* to****Document 4(Add.2)-E** |
| **29 September2015** |
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| Director, Radiocommunication Bureau |
| REPORT OF THE DIRECTOR ON THE ACTIVITIES OF THE RADIOCOMMUNICATION SECTOR |
| PART 2 eXPERIENCE IN THE APPLICATION OF radio regulatoRY PROCEDURES AND OTHER RELATED MATTERS |
|  |

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# 1 Introduction

This part of the Bureau’s Report summarizes the experience of the Radiocommunication Bureau in administering the Radio Regulations (RR), including the difficulties and inconsistencies encountered in the application of the relevant provisions. It should be noted that some of the issues reflected in this part of the Report are explicitly on the agenda of WRC-15 and could be examined in the context of Member States’ proposals to WRC-15.

The Report is submitted to WRC-15 for consideration under agenda item 9.2. The issues that may be associated with other agenda items are indicated accordingly. As for the other issues that could not be associated with any specific agenda item, except agenda item 9.2, the Conference may wish to consider appropriate mechanisms for fixing the problems reported, including the option of formulating suitable agenda item(s) for the next Conference.

# 2 Preparation of the Radio Regulations (2012 edition)

## 2.1 General comments

### 2.1.1 Introduction of modern electronic communication methods[[2]](#footnote-2)

Decision 5 (Rev. Busan, 2014) – Revenue and expenses for the Union for the period 2016‑2019 – includes in its Annex 2 (Measures for reducing expenditure), paragraph 28 proposing to “discontinue to the greatest extent possible communications by fax and traditional postal mail between the Union and Member States and replace it with modern electronic communication methods”.

Several provisions of the RR instruct the Bureau or administrations to send a circular telegram/fax, for example Nos. **9.45**-**9.46**, **AP30** – 4.1.6, 4.2.8, 4.2.9, etc. In some provisions the Bureau is instructed to communicate with administrations, without specifying communication methods (e.g. Nos. **9.2A** and **9.2B.1**). In many occurrences, therefore, the Bureau, in conformity with the RR, only recognizes a telegram/fax as an official correspondence.

Regarding various means available for transmission and delivery of notices and other related correspondences, the Radio Regulations Board (RRB) recognized in its Rules of Procedure 2012 edition on Receivability, that information may be sent by e-mail to ITU (brmail@itu.int). Paragraph 2 of the same rule requires also “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.”

The Bureau is currently facing increasing difficulties in informing administrations of its actions in the application of the Radio Regulations through telefaxes. Almost 10% of administrations have not been reachable at all with the telefax number communicated by them, for another 12% of administrations in more than 50% of cases the administrations have not been reachable due to unidentified reasons (paper shortage, busy lines, incorrectly functioning machines, etc.). In a few cases it has been reported that administrations have actually received the Bureau’s telefaxes but transmission errors were detected during transmission. In all cases where transmission errors are indicated by the Bureau’s telefax machine, the same information is sent by surface mail. However, this significantly increases the Bureau’s workload and may lead to a delay of response by administrations with potentially adverse regulatory effects for the administrations’ filings. At this stage more than 30% of administrations have indicated to the Bureau that the correspondence should be sent by e-mail in line with Circular letter CR/366. The Bureau has not encountered any difficulty in reaching these administrations, except for very few specific cases.

In order to take account of the wish of PP-14 to move towards modern electronic communication methods and to alleviate the Bureau’s and the administrations’ difficulties with the current telefax approach, WRC-15 may wish to consider reviewing RR Article **1** (Terms and definitions) in order to specify any new recognized modern electronic communication means in addition to existing circular telegram/fax methods, and also to consider authorizing the introduction of digital signature in the electronic communication (Decision 5 (Rev. Busan, 2014), Annex 2, paragraph 11) and/or secure encrypted web servers for communication and distribution of documents between ITU and Member States. Relevant articles and provisions of the Radio Regulations, that may be currently an impediment to the implementation of “modern electronic communication methods”, would need to be reviewed and modified accordingly.

## 2.2 Errors, inconsistencies and out-of-date provisions

### 2.2.1 Typographical and other apparent errors (including incorrect references)

In the preparation of the 2008 edition of the RR, the Bureau has corrected the typographical errors that were noticed in the 2004 edition and which were reported to WRC-12.

In addition, the Bureau introduced those consequential changes and amendments to the RR as necessitated by the decisions of WRC-12, for which the Bureau received explicit authorizations from WRC-12.

Subsequent to the publication of the 2012 edition, a number of typographical and other apparent errors in different languages were detected in that edition. These errors, as summarized in Table 1, are submitted to WRC‑15 for consideration, with a view to obtaining the necessary approval for correcting them in the forthcoming edition of the RR.

Table 1

List of typographical and other apparent errors discovered in the 2012 edition of the RR

| **#** | **Language** | **Page** | **Incorrect or missing text** | **Correct text** |
| --- | --- | --- | --- | --- |
| 1 |  | **Vol. 1** | Preamble | Preamble |
| 2 | All | 3 | **0.3** In using frequency bands for radio services, Members shall bear in mind that radio frequencies and the geostationary-satellite orbit are limited natural resources and that they must be used rationally, efficiently and economically, in conformity with the provisions of these Regulations, so that countries or groups of countries may have equitable access to both, taking into account the special needs of the developing countries and the geographical situation of particular countries (No. 196 of the Constitution). | **0.3** In using frequency bands for radio services, Members shall bear in mind thatradio frequencies and any associated orbits, including the geostationary-satellite orbit, are limited natural resources and that they must be used rationally, efficiently and economically, in conformity with the provisions of these Regulations, so that countries or groups of countries may have equitable access to those orbits and frequencies, taking intoaccount the special needs of the developing countries and the geographical situation of particular countries (No. 196 of the Constitution). |
| 3 |  | **Vol. 1** | Articles |  |
| 4 | R | 37 | **PP5-1****Раздел I – Районы и зоны****5.2** В целях распределения частот мир разделен на три Района1, как показано на приведенной ниже карте и описано в пп. **5.3**–**5.9**:РЕГИОН 1РЕГИОН 2РЕГИОН 3 | **PP5-1****Раздел I – Районы и зоны****5.2** В целях распределения частот мир разделен на три Района1, как показано на приведенной ниже карте и описано в пп. **5.3**–**5.9**:РАЙОН 1РАЙОН 2РАЙОН 3(Ред. примечание. – Заменить в подписях к карте слово «РЕГИОН» на «РАЙОН») |
| 5 | All | 47 | **RR5-11*****(Region 1)*****283.5-315**AERONAUTICAL RADIONAVIGATIONMARITIME RADIONAVIGATION(radiobeacons) 5.735.72 5.74 | **RR5-11*****(Region 1)*****283.5-315**AERONAUTICAL RADIONAVIGATIONMARITIME RADIONAVIGATION(radiobeacons) 5.735.74 |
| 6 | All | 47 | **RR5-11*****(Region 1)*****315-325**AERONAUTICAL RADIONAVIGATIONMaritime radionavigation (radiobeacons) 5.735.72 5.75 | **RR5-11*****(Region 1)*****315-325**AERONAUTICAL RADIONAVIGATIONMaritime radionavigation (radiobeacons) 5.735.75 |
| 7 | All | 47 | **RR5-11*****(Region 1)*****325-405**AERONAUTICAL RADIONAVIGATION5.72 | **RR5-11*****(Region 1)*****325-405**AERONAUTICAL RADIONAVIGATION |
| 8 | All | 47 | **RR5-11*****(Region 1)*****405-415**RADIONAVIGATION 5.765.72 | **RR5-11*****(Region 1)*****405-415**RADIONAVIGATION 5.76 |
| 9 | All | 52 | **RR5-16*****(Region 1)*****1 810-1 850**AMATEUR5.98 5.99 5.100 5.101 | **RR5-16*****(Region 1)*****1 810-1 850**AMATEUR5.98 5.99 5.100 |
| 10 | R | 52 | **PP5-16****1800–2194 кГц**

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| --- |
| **Распределение по службам** |
| **Район 2** | **Район 2** | **Район 2** |

 | **PP5-16****1800–2194 кГц**

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| --- |
| **Распределение по службам** |
| **Район 1** | **Район 2** | **Район 3** |

 |
| 11 | S | 61 | **RR5-255.141B** *Atribución adicional:*  a partir del 29 de marzo de 2009, … y Yemen, la banda 7 100-7 200 kHz también estará atribuida a título primario a los servicios fijo y móvil salvo móvil aeronáutico (R).     (CMR-03) | **RR5-255.141B** *Atribución adicional:*  a partir del 29 de marzo de 2009, … y Yemen, la banda 7 100-7 200 kHz también estará atribuida, a título primario, a los servicios fijo y móvil salvo móvil aeronáutico (R).     (CMR-03) |
| 12 | S | 84 | **RR5-48328,6-335,4**RADIONAVEGACIÓN AERONÁUTICA 5.259 | **RR5-48****328,6-335,4**RADIONAVEGACIÓN AERONÁUTICA 5.2585.259 |
| 13 | All | 88 | **RR5-52*(Region 1)*****430-432**AMATEURRADIOLOCATION5.271 5.272 5.273 5.2745.275 5.276 5.277 | **RR5-52*(Region 1)*****430-432**AMATEURRADIOLOCATION5.271 5.2745.275 5.276 5.277 |
| 14 | All | 88 | **RR5-52*(Region 1)*****432-438**AMATEURRADIOLOCATIONEarth exploration-satellite (active) 5.279A5.138 5.271 5.272 5.276 5.277 5.280 5.281 5.282 | **RR5-52*(Region 1)*****432-438**AMATEURRADIOLOCATIONEarth exploration-satellite (active) 5.279A5.138 5.271 5.276 5.277 5.280 5.281 5.282 |
| 15 | All | 88 | **RR5-52*(Region 1)*****438-440**AMATEURRADIOLOCATION5.271 5.273 5.274 5.275 5.276 5.277 5.283 | **RR5-52 *(Region 1)*****438-440**AMATEURRADIOLOCATION5.271 5.274 5.275 5.276 5.277 5.283 |
| 16 | C | 89 | **RR5-535.279A** 卫星地球探测业务（EESS）(有源)中的遥感器对该频段的使用应遵守ITU-R SA.1260-1建议书。此外，432-438MHz频段内的EESS业务（有源）不应对中国的航空无线电导航业务产生有害干扰。本脚注的规定无论如何没有减轻根据第5.29款和5.30款作为次要业务的操作的卫星地球探测业务（有源）的义务。（WRC-03） | **RR5-535.279A** 卫星地球探测业务（EESS）(有源)中的遥感器对该频段的使用应遵守ITU-RRS.1260-1建议书。此外，432-438MHz频段内的EESS业务（有源）不应对中国的航空无线电导航业务产生有害干扰。本脚注的规定无论如何没有减轻根据第5.29款和5.30款作为次要业务的操作的卫星地球探测业务（有源）的义务。（WRC-03） |
| 17 | C | 90 | **RR5-545.286C** 454-455MHz频段在第**5.286D**款所列的国家内，455-456MHz和459-460MHz频段在2区以及454-456MHz和459-460MHz频段在第**5.286E**款所列的国家内，卫星移动业务电台使用时不得限制按照频率划分表操作的固定或移动业务的发展及使用。（WRC-97） | **RR5-545.286C** 454-455MHz频段在第**5.286D**款所列的国家内，455-456MHz和459-460MHz频段在2区以及454-456MHz和459-460MHz频段在第**5.286E**款所列的国家内，卫星移动业务电台使用时不得限制按照频率划分表操作的固定和移动业务的发展及使用。（WRC-97） |
| 18 | R | 96 | **PP5-601 164–1 215**ВОЗДУШНАЯ РАДИОНАВИГАЦИОННАЯ 5.328РАДИОНАВИГАЦИОННАЯ СПУТНИКОВАЯ (космос-Земля) (космос-космос) 5.238В5.328А | **PP5-601 164–1 215**ВОЗДУШНАЯ РАДИОНАВИГАЦИОННАЯ 5.328РАДИОНАВИГАЦИОННАЯ СПУТНИКОВАЯ (космос-Земля) (космос-космос) 5.328B5.328А |
| 19 | S | 110 | **RR5-745.388** Las bandas 1 885-2 025 MHz y 2 110-2 200 MHz están destinadas a su utilización, a nivel mundial, por las administraciones que desean introducir las telecomunicaciones móviles internacionales 2000 (IMT). Dicha utilización no excluye el uso de estas bandas por otros servicios a los que están atribuidas. Las bandas de frecuencias deberían ponerse a disposición de las IMT 2000 de acuerdo con lo dispuesto en la Resolución **212 (Rev.CMR-97**)[[3]](#footnote-3)\*. Véase también la Resolución 223 (CMR-2000)\*.)      (CMR-2000) | **RR5-745.388** Las bandas 1 885-2 025 MHz y 2 110-2 200 MHz están destinadas a su utilización, a nivel mundial, por las administraciones que desean introducir las telecomunicaciones móviles internacionales (IMT). Dicha utilización no excluye el uso de estas bandas por otros servicios a los que están atribuidas. Las bandas de frecuencias deberían ponerse a disposición de las IMT de acuerdo con lo dispuesto en la Resolución **212 (Rev.CMR-07)**. Véase también la Resolución **223 (Rev.CMR‑07)**.      (CMR-2000) |
| 20 | S | 110 | **RR5-745.388B** Para proteger los servicios fijo y móvil, incluidas las estaciones móviles IMT 2000, en los territorios de Argelia, ..., contra interferencia en el mismo canal, una estación en plataforma a gran altitud que funcione como estación de base IMT 2000 en los países vecinos, en las bandas a las que se refiere el número 5.388A, no rebasará... | **RR5-745.388B** Para proteger los servicios fijo y móvil, incluidas las estaciones móviles IMT, en los territorios de Argelia, ..., contra interferencia en el mismo canal, una estación en plataforma a gran altitud que funcione como estación de base IMT en los países vecinos, en las bandas a las que se refiere el número 5.388A, no rebasará... |
| 21 | All | 112 | **RR5-76*(Region 1)*****2 450-2 483.5**FIXEDMOBILERadiolocation5.150 5.397 | **RR5-76*(Region 1)*****2 450-2 483.5**FIXEDMOBILERadiolocation5.150 |
| 22 | All | 112 | **RR5-76*(Region 1)*****2** **500-2** **520**FIXED 5.410MOBILE except aeronautical mobile 5.384A5.405 5.412 | **RR5-76*(Region 1)*****2** **500-2** **520**FIXED 5.410MOBILE except aeronautical mobile 5.384A 5.412 |
| 23 | E, S, F | 113 | **RR5-775.398A** *Different category of service:*In Armenia, Azerbaijan, … | **RR5-775.398A** *Different category of service:*in Armenia, Azerbaijan, … |
| 24 | All | 115 | **RR5-79*(Region 1)*****2** **520-2** **655**FIXED 5.410MOBILE except aeronauticalmobile 5.384ABROADCASTING-SATELLITE 5.413 5.4165.339 5.405 5.412 5.417C 5.417D 5.418B 5.418C | **RR5-79*(Region 1)*****2** **520-2** **655**FIXED 5.410MOBILE except aeronauticalmobile 5.384ABROADCASTING-SATELLITE 5.413 5.4165.339 5.412 5.417C 5.417D 5.418B 5.418C |
| 25 | C | 116 | **RR5-805.417B** 在韩国和日本，就视为在2003年4月4日之后收到附录**4**全部协调资料或通知资料的对地静止卫星网络而言，在2003年7月4日之后收到附录**4**全部协调资料或通知资料的卫星广播业务（声音）非对地静止卫星系统根据第**5.417A**款使用2605-2630MHz频段时，须应用第**9.12A**款的规定，且第**22.2**款不适用。对于视为在2003年7月5日之前收到附录**4**全部协调资料或通知资料的对地静止卫星网络，第**22.2**款仍然适用。（WRC-03） | **RR5-805.417B** 在韩国和日本，就视为在2003年7月4日之后收到附录**4**全部协调资料或通知资料的对地静止卫星网络而言，在2003年7月4日之后收到附录**4**全部协调资料或通知资料的卫星广播业务（声音）非对地静止卫星系统根据第**5.417A**款使用2605-2630MHz频段时，须应用第**9.12A**款的规定，且第**22.2**款不适用。对于视为在2003年7月5日之前收到附录**4**全部协调资料或通知资料的对地静止卫星网络，第**22.2**款仍然适用。（WRC-03） |
| 26 | S | 124 | **RR5-885 460-5 470**RADIONAVEGACIÓN 5.449EXPLORACIÓN DE LA TIERRA POR SATÉLITE (activo)INVESTIGACIÓN ESPACIAL (activo)RADIOLOCALIZACIÓN 5.448D5.448B | **RR5-885 460-5 470**EXPLORACIÓN DE LA TIERRA POR SATÉLITE (activo)RADIOLOCALIZACIÓN 5.448DRADIONAVEGACIÓN 5.449INVESTIGACIÓN ESPACIAL (activo)5.448B |
| 27 | S | 124 | **RR5-885 470-5 570**RADIONAVEGACIÓN MARÍTIMAMÓVIL salvo móvil aeronáutico 5.446A 5.450AEXPLORACIÓN DE LA TIERRA POR SATÉLITE (activo)INVESTIGACIÓN ESPACIAL (activo)RADIOLOCALIZACIÓN 5.450B5.448B 5.450 5.451 | **RR5-885 470-5 570**EXPLORACIÓN DE LA TIERRA POR SATÉLITE (activo)MÓVIL salvo móvil aeronáutico 5.446A, 5.450ARADIOLOCALIZACIÓN 5.450BRADIONAVEGACIÓN MARÍTIMAINVESTIGACIÓN ESPACIAL (activo)5.448B 5.450 5.451 |
| 28 | C | 126 | **RR5-905.447F** 在5250-5350MHz频段内，移动业务电台不应要求无线电定位业务、卫星地球探测业务（有源）和空间研究业务（有源）的保护。这些业务不得在系统特性和干扰标准方面对移动业务实行比ITU-R M.1638和ITU-R SA.1632建议书中所述更为严格的保护标准。（WRC-03） | **RR5-905.447F** 在5250-5350MHz频段内，移动业务电台不应要求无线电定位业务、卫星地球探测业务（有源）和空间研究业务（有源）的保护。这些业务不得在系统特性和干扰标准方面对移动业务实行比ITU-R M.1638和ITU-RRS.1632建议书中所述更为严格的保护标准。（WRC-03） |
| 29 | C | 127 | **RR5-91**(1区)**5 830-5 850****卫星固定** （空对地）**无线电定位**业余卫星业余（空对地） | **RR5-91**(1区)**5 830-5 850****卫星固定** （地对空）**无线电定位**业余卫星业余（空对地） |
| 30 | E | 131 | **RR5-955.462A** … −135 + 0.5 (θ − 5) dB(W/m2) in a 1 MHz band for    5° ≤ θ <   5° | **RR5-955.462A** … −135 + 0.5 (θ − 5) dB(W/m2) in a 1 MHz band for    5° ≤ θ <   25° |
| 31 | C | 141 | **RR5-105****14.25-14.3 卫星固定**（地对空） 5.457A 5.457B 5.484A 5.506 5.506B **无线电导航** 5.504 卫星移动（地对空） 5.504B 5.506A 5.508A 空间研究 5.504A 5.505 5.508 5.509 | **RR5-105****14.25-14.3 卫星固定**（地对空） 5.457A 5.457B 5.484A 5.506 5.506B **无线电导航** 5.504 卫星移动（地对空） 5.504B 5.506A 5.508A 空间研究 5.504A 5.505 5.508  |
| 32 | E | 148 | **RR5-112****18.8-19.3 GHz** FIXED-SATELLITE (space-to-Earth) 5.516.B 5.523A | **RR5-112****18.8-19.3 GHz** FIXED-SATELLITE (space-to-Earth) 5.516B |
| 33 | F | 196 | **RR9-109.52** Si, à la suite des mesures prises aux termes du numéro **9.50**, une administration n'accède pas à la demande de coordination, elle informe l'administration requérante de son désaccord et fournit des renseignements sur celles de ses assignations qui font l'objet du désaccord, dans un délai de quatre mois à compter de la date de publication de la Circulaire hebdomadaire conformément aux dispositions du numéro **9.38**, ou à compter de la date d'envoi des renseignements pour la coordination conformément au numéro **9.29**. … | **RR9-109.52** Si, à la suite des mesures prises aux termes du numéro **9.50**, une administration n'accède pas à la demande de coordination, elle informe l'administration requérante de son désaccord et fournit des renseignements sur celles de ses assignations qui font l'objet du désaccord, dans un délai de quatre mois à compter de la date de publication de la Circulaire BR IFIC conformément aux dispositions du numéro **9.38**, ou à compter de la date d'envoi des renseignements pour la coordination conformément au numéro **9.29**. … |
| 34 | S | 220 | RR13-213.6 *b)* cuando de la información disponible se desprenda que una asignación inscrita no se ha puesto en servicio, ha quedado fuera de uso o continúa en funcionamiento pero no de conformidad con las características requeridas notificadas según se especifica en el Apéndice **4**,…. | RR13-213.6 *b)* cuando de la información fiable disponible se desprenda que una asignación inscrita no se ha puesto en servicio, ha quedado fuera de uso o continúa en funcionamiento pero no de conformidad con las características requeridas notificadas según se especifica en el Apéndice **4**,…. |
| 35 | All | 229 | **RR15-315.21** … in particular Article **45** of the Constitution… | **RR15-315.21**… in particular Article 45 of the Constitution… |
| 36 | All | 229 | **RR15-315.22** … provisions of Article **45** of the Constitution… | **RR15-315.22** … provisions of Article 45 of the Constitution… |
| 37 | E | 259 | **RR21-321.8** … where θ is the angle of elevation of the horizon viewed from the centre of radiation of the antenna of the earth station and measured in degrees as positive above the horizontal plane and negative below it. | **RR21-321.8** … where θ is the angle of elevation of the horizon viewed from the centre of radiation of the antenna of the earth station and measured in degrees as positive above the horizontal plane and negative below it. |
| 38 | All | 260 | **RR21-4**Table **21-3** (Rev.WRC-12)

|  |  |
| --- | --- |
| 14.25-14.3 GHz  | (with respect to the countries listed inNos. **5.505**, **5.508** and **5.509**) |

 | **RR21-4**Table **21-3** (Rev.WRC-12)

|  |  |
| --- | --- |
| 14.25-14.3 GHz  | (with respect to the countries listed inNos. **5.505** and **5.508**) |

 |
| 39 | R | 262 | **PP21-6**ТАБЛИЦА **21-4**     (Пересм. ВКР-12)

| **Полоса частот** | **…** | **Предел, в дБ(Вт/м2), при угле прихода (δ) относительно горизонтальной плоскости** | **…** |
| --- | --- | --- | --- |
| 1 525–1 530 МГц7(Район 1, Район 3)1 670–1 690 МГц111 690–1 700 МГц(пп. **5.381** и **5.382**)1 700–1 710 МГц2 025–2 110 МГц2 200–2 300 МГц | … | **…** | **…** | **25°–90°** | ... |
| **…** | **…** | –149 | … |

 | **PP21-6**ТАБЛИЦА **21-4**     (Пересм. ВКР-12)

| **Полоса частот** | **…** | **Предел, в дБ(Вт/м2), при угле прихода (δ) относительно горизонтальной плоскости** | **…** |
| --- | --- | --- | --- |
| 1 525–1 530 МГц7(Район 1, Район 3)1 670–1 690 МГц111 690–1 700 МГц(пп. **5.381** и **5.382**)1 700–1 710 МГц2 025–2 110 МГц2 200–2 300 МГц | … | **…** | **…** | **25°–90°** | ... |
| **…** | **…** | –1449 | … |

 |
| 40 | C | 285 | **RR22-1522.17** b)其位置应该保持在标称位置的经度±0.5°以内，但是 | **RR22-1522.17** b)其位置应该保持在标称位置的经度±1°以内，但是 |
| 41 | F | 286 | **RR22-16**32 **22.22.1** La zone tranquille de la Lune comprend la partie de la surface de la Lune et le volume d'espace adjacent qui sont protégés des émissions provenant d'un point situé à moins de 100 000 km du centre de la Terre. | **RR22-16**32 **22.22.2** Le niveau de brouillage préjudiciable est fixé par accord entre les administrations intéressées compte tenu des Recommandations pertinentes de l'UIT-R. |
| 42 | All | 288 | **RR22-1822.32** **§ 10 …**48   180 1 dB(W/40 kHz) | **RR22-1822.32** **§ 10 …**48   180 11 dB(W/40 kHz) |
| 43 | C | 288 | **RR22-1822.34** 以正常运营方式（即向空间电台上定向接收天线发射指令和测距载波的地球站）向卫星固定业务中对地静止卫星发射指令和测距载波在29.5-30 GHz频段内可以超过第**22.32**款给出的10dB以上的电平。在其他所有操作方式中和在不可抗拒的情况下，向卫星固定业务中对地静止卫星发射的指令和测距载波不受第**22.32**款给出的电平的限制。（WRC-2000） | **RR22-1822.34** 以正常运营方式（即向空间电台上定向接收天线发射指令和测距载波的地球站）向卫星固定业务中对地静止卫星发射指令和测距载波在29.5-30 GHz频段内可以超过第**22.32**款给出的10dB电平的限制。在其他所有操作方式中和在不可抗拒的情况下，向卫星固定业务中对地静止卫星发射的指令和测距载波不受第**22.32**款给出的电平的限制。（WRC-2000） |
| 44 | C | 312 | **RR30-22 30.7.1** 在划分给航空移动业务的频段内，与航空移动（R）业务电台通信的移动电台应符合本规则中有关该种业务的规定，以及如适当，并符合有关政府间管制航空移动（R）业务的任何特别协议。 | **RR30-22 30.7.1** 在划分给航空移动业务（R）的频段内，与航空移动（R）业务电台通信的移动电台应符合本规则中有关该种业务的规定，以及如适当，并符合有关政府间管制航空移动（R）业务的任何特别协议。 |
| 45 | C | 328 | **RR32-1232.56** 2)现场通信的控制是协调搜索和救援作业10单位的一种指责。应该使用单工通信，以便所有现场移动电台都可分享涉及遇险事故的有关信息。如果使用直接印字电报，应该前向纠错方式。 | **RR32-1232.56** 2)现场通信的控制是协调搜索和救援作业9单位的一种指责。应该使用单工通信，以便所有现场移动电台都可分享涉及遇险事故的有关信息。如果使用直接印字电报，应该前向纠错方式。 |
| 46 | C | 328 | **RR32-1232.59** §35 挑选或指定现场频率是由协调搜索和救援作业10的单位负责。 | **RR32-1232.59** §35 挑选或指定现场频率是由协调搜索和救援作业9的单位负责。 |
| 47 | R | 348 | **PP37-237.13** 2) Обладатель общего диплома оператора-радиотелефониста может обслуживать любую радиотелефонную станцию воздушного судна или земной станции воздушного судна. | **PP37-237.13** 2) Обладатель общего диплома оператора-радиотелефониста может обслуживать любую радиотелефонную станцию воздушного судна или земную станцию воздушного судна. |
| 48 | R | 348 | **PP37-237.14** 3) Обладатель ограниченного диплома оператора-радиотелефониста может обслуживать любую радиотелефонную станцию воздушного судна или земной станции воздушного судна,….. | **PP37-237.14** 3) Обладатель ограниченного диплома оператора-радиотелефониста может обслуживать любую радиотелефонную станцию воздушного судна или земную станцию воздушного судна,….. |
| 49 | S, F | 359 | **RR42-142.3** …in the appropriate section of Appendix16 (Section IV, “Aircraft stations”). | **RR42-142.3**…in the appropriate section of Appendix16 (Section IV, “Stations on board aircraft”). |
| 50 | R | 375 | **PP47-4**ТАБЛИЦА **47-1****Требования для получения диплома оператора радиоэлектронного оборудования и диплома оператора**ПРИМЕЧАНИЕ 2. – Условия выдачи дипломов дальнего и ближнего плавания содержатся в Резолюции **343 (ВКР‑97)**.     (ВКР-07) | **PP47-4**ТАБЛИЦА **47-1****Требования для получения диплома оператора радиоэлектронного оборудования и диплома оператора**ПРИМЕЧАНИЕ 2. − (SUP – ВКР-12) |
| 51 |  | **Vol. 2** | Appendices | Appendices |
| 52 | C | 11 | **AP2-3**频段：**100 MHz至470 MHz**1 固定电台：– 功率小于等于500W– 功率大于50W | **AP2-3**频段：**100 MHz至470 MHz**1 固定电台：– 功率小于等于50W– 功率大于50W |
| 53 | F | 104 | **AP4-78C – CARACTÉRISTIQUES À FOURNIR POUR CHAQUE GROUPE D'ASSIGNATION DE FRÉQUENCE D'UN FAISCEAU D'ANTENNE DE SATELLITE OU D'UNE ANTENNE DE STATION TERRIENNE OU D'UNE ANTENNE DE STATION DE RADIOASTRONOMIE** | **AP4-78 D – CARACTÉRISTIQUES GLOBALES DES LIAISONS** |
| 54 | C | 154 | **AP7-203 确定在双向划分频段内操作的地球站之间的协调区**…下文中描述了双向操作的各种不同情况下确定协调区的方法，对两种地球站都与非对地静止空间电台共同操作的协调情况都适用的程序见第3.1节。其他双向协调情况见第3.2节。其中应尤其注意按第2节的适当程序对每种可能的协调情况使用水平天线增益的方法。 | **AP7-203 确定在双向划分频段内操作的地球站之间的协调区**…下文中描述了双向操作的各种不同情况下确定协调区的方法，对两种地球站都与对地静止空间电台共同操作的协调情况都适用的程序见第3.1节。其他双向协调情况见第3.2节。其中应尤其注意按第2节的适当程序对每种可能的协调情况使用水平天线增益的方法。 |
| 55 | F | 232 | **AP8-2**A : direction, à partir du satellite S, de la station terrienne d'émission eT pour la iaison par atellite A; | **AP8-2**A : direction, à partir du satellite S, de la station terrienne d'émission eT pour la liaison par satellite A; |
| 56 | All | 234 | **AP8-4** (4) | **AP8-4** (4) |
| 57 | All | 234 | **AP8-4** (7) | **AP8-4** (7) |
| 58 | E, C | 235 | **AP8-5****2.2.2.1 Simple frequency-changing transponder on board the satellite**s (10) | **AP8-5****2.2.2.1 Simple frequency-changing transponder on board the satellite** (10) |
| 59 | All | 238-241 | **AP8** Annex I, Annex II, Annex III, Annex IV | **AP8**Annex 1, Annex 2, Annex 3, Annex 4 |
| 60 | F | 239 | **AP8-9 (PDF version only)***a)* La distance *d* entre une station terrienne et un satellite géostationnaire est donnée par la formule: | **AP8-9 (PDF version only)***a)* La distance *d* entre une station terrienne et un satellite géostationnaire est donnée par la formule: |
| 61 | ALL | 240 | **AP8-10**a) for values of 4 (maximum gain ≥ 48 dB approximately):…b) for values of < 100 4 (maximum gain ≥ 48 dB approximately):...\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_4 In cases where  is not given, it may be estimated from the expression 20 log  ≈ *Gmax* − 7.7, where *Gmax* is the main lobe antenna gain (dB). | **AP8-10**a) for values of 4 (maximum gain ≥ 48 dBi approximately):… b) for values of  < 100 4 (maximum gain ≥ 48 dBi approximately):....\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_4 In cases where  is not given, it may be estimated from the expression 20 log  ≈ *Gmax* − 7.7, where *Gmax* is the main lobe antenna gain (dBi). |
| 62 | E, C | 241 | **AP8-11**G(φ) = −10 − 10 log  for 48°≤ φ ≤180° | **AP8-11**G(φ) = 10 − 10 log  for 48°≤ φ ≤180° |
| 63 | E, A, S, F, R | 242 | **AP8-12****2 Input data**The values of the network parameters given in the table below are derived from those published in accordance with Appendix **4**.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Symbol\*** | **Value** | **Unit** |
| … |  |  |  |
| Downlink at 3 950 MHz | *P*′*s**G*′3(η*e*)*G*4(θ*t*)*Ld* |  −57 −15.5 14.5 196 | dB(W/Hz)dBdBdB |
|  | 10 log γ*T*θ*t* |  15 105 5 | dBKdegrees |

 | **AP8-12****2 Input data**The values of the network parameters given in the table below are derived from those published in accordance with Appendix **4**.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Symbol\*** | **Value** | **Unit** |
| … |  |  |  |
| Downlink at 3 950 MHz | *P*′*s**G*′3(η*e*)*G*4(θ*t*)*Ld* |  −57 15.5 14.5 196 | dB(W/Hz)dBdBdB |
|  | 10 log γ*T*θ*t* |  −15 105 5 | dBKdegrees |

 |
| 64 | C | 272 | **AP17-6****在4 000 kHz和27 500 kHz之间划分给水上移动业务的各专用频段内的使用频率（kHz）（完）**d) 见B部分第I节。e) 在船舶电台用于工作速度不超过40波特的A1A莫尔斯电报的各频段内，主管部门在可指配的频率之间可以指配交错的附加频率。这样指配的任何频率都应为100 kHz的整数倍。主管部门应保证在各频段内进行的这种指配是均匀分布的。 | **AP17-6****在4 000 kHz和27 500 kHz之间划分给水上移动业务的各专用频段内的使用频率（kHz）（完）**d) 见B部分第II节。e) 在船舶电台用于工作速度不超过40波特的A1A莫尔斯电报的各频段内，主管部门在可指配的频率之间可以指配交错的附加频率。这样指配的任何频率都应为100 Hz的整数倍。主管部门应保证在各频段内进行的这种指配是均匀分布的。 |
| 65 | C | 300 |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 可指配给海岸电台用于数据传输的频率e) m) p) q) u) w) |  |  | **8 409.5**至**8 412.5**2 f.3 kHz |  |  |  |  |  |
| 限值 (kHz) | 4 207.25 | 6 311.75 | 8 374.75 | 12 476.25 | 16 681.75 | 18 898.25 | 22 289.75 | 25 208.25 |

**AP17-34** |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 可指配给海岸电台用于数据传输的频率e) m) p) q) u) w) |  |  | **8 409.5**至**8 412.5**2 f.3 kHz |  |  |  |  |  |
| 限值 (kHz) | 4 207.25 | 6 311.75 | 8414 | 12 576.75 | 16 804 | 18 898.25 | 22 374.25 | 25 208.25 |

**AP17-34** |
| 66 | F | 480 | **AP30-4**2A.1.1 La coordination entre les assignations destinées à assurer les fonctions d'exploitation spatiale et les assignations du SRS relevant d'un Plan est effectuée conformément aux dispositions de l'Article 7.     (CMR‑07) | **AP30-4**2A.1.1 La coordination entre les assignations destinées à assurer les fonctions d'exploitation spatiale et les assignations du SRS relevant d'un Plan est effectuée conformément aux dispositions de l'Article 7. |
| 67 | E | 489 | **AP30-13**4.2.3 *c)* …modifications to that Plan have been re*c*eived by the Bureau… | **AP30-13**4.2.3 *c)*…modifications to that Plan have been received by the Bureau… |
| 68 | All | 489 | **AP30-13****4.2.6**14 The provisions of Resolution **533 (Rev.WRC‑2000)** apply.  (WRC‑03) | **AP30-13****4.2.6**14 The provisions of Resolution **533 (Rev.WRC‑2000)\*\*** apply.  (WRC‑03)\*\* *Note by the Secretariat*: This Resolution was abrogated by WRC-12. |
| 69 | E, A, C, S, R | 492 | **AP30-16**4.2.16 …Article **5**… | **AP30-16**4.2.16 …Article 5… |
| 70 | E, A, C, S, R | 493 | **AP30-17**4.2.23 …Article **5**… | **AP30-17**4.2.23 …Article 5… |
| 71 | E | 505 | **AP30-29**TABLE 3

|  |  |  |  |
| --- | --- | --- | --- |
| BeamName | Channels | LimitCriteria ref.Table 2 | Countries or geographical areas affected3\* |

 | **AP30-29**TABLE 3

|  |  |  |  |
| --- | --- | --- | --- |
| BeamName | Channels | LimitCriteria ref.Table 2 | Countries or geographical areas affected\* |

 |
| 72 | A, S | 570 | **AP30-94**–148 dB(W/(m2 ⋅ 4 kHz)) for θ ≤ 5°–148 + 0.5 (θ – 5) dB(W(m2 ⋅ 4 kHz) for 5° < θ ≤ 25°–138 dB(W/(m2 ⋅ 4 kHz)) for 25° < θ ≤ 90° | **AP30-94**–148 dB(W/(m2 ⋅ 4 kHz)) for θ ≤ 5°–148 + 0.5 (θ – 5) dB(W/(m2 ⋅ 4 kHz) for 5° < θ ≤ 25°–138     dB(W/(m2 ⋅ 4 kHz)) for 25° < θ ≤ 90° |
| 73 | C | 591 | **AP30-1152.2.2 雨衰减**图4表示的雨衰减图，是使用（9）式计算的在12.5GHz频段上在最坏月份1%时间内所超过的圆极化信号的雨衰减值，作为图3所示的每个雨气候区地球站纬度和仰角的函数 | **AP30-1152.2.2 雨衰减**图4表示的雨衰减图，是使用（31）式计算的在12.5GHz频段上在最坏月份1%时间内所超过的圆极化信号的雨衰减值，作为图3所示的每个雨气候区地球站纬度和仰角的函数 |
| 74 | C | 613 | **AP30-1373.13.3 发射天线参考方向性图**图11所示的方向图；这种使用在规划中用适当的符号加以注明。这个方向图取自一个在假定0.8°的“小波束”半功率波束宽的主瓣内产生具有迅速滚降的椭圆波束的天线。对于1区和3区，使用图11B中所示的以0.6°的“小波束”波束宽为基础的方向图。三条不同的φ0值的曲线示作图11A和图11B中的例子。 | **AP30-1373.13.3 发射天线参考方向性图**在2区，当需要减少干扰时，使用图11A所示的方向图；这种使用在规划中用适当的符号加以注明。这个方向图取自一个在假定0.8°的“小波束”半功率波束宽的主瓣内产生具有迅速滚降的椭圆波束的天线。对于1区和3区，使用图11B中所示的以0.6°的“小波束”波束宽为基础的方向图。三条不同的φ0值的曲线示作图11A和图11B中的例子。 |
| 75 | A, C,S, F | 630 | **AP30A-2****Article 7**Coordination, notification and recording …frequency assignments to stations in the fixed-satellite service (space-to-Earth) in Region 1 in the band 17.3-18.1 GHz and in Regions 2 and 3 in the band 17.7-18.1 GHz to stations in the fixed-satellite service (Earth-to-space) in Region 2 in the band 17.8-18.1 GHz and to stations in the broadcasting-satellite service in Region 2 in the band 17.3-17.8 GHz when frequency assignments …. are involved | **AP30A-2****Article 7**Coordination, notification and recording …frequency assignments to stations in the fixed-satellite service (space-to-Earth) in Region 1 in the band 17.3-18.1 GHz and in Regions 2 and 3 in the band 17.7-18.1 GHz, to stations in the fixed-satellite service (Earth-to-space) in Region 2 in the band 17.8-18.1 GHz and to stations in the broadcasting-satellite service in Region 2 in the band 17.3-17.8 GHz when frequency assignments … are involved |
| 76 | A, C,S, F | 653 | **AP30A-25****Article 7(REV.WRC-12)**Coordination, notification and recording …frequency assignments to stations in the fixed-satellite service (space-to-Earth) in Region 1 in the band 17.3-18.1 GHz and in Regions 2 and 3 in the band 17.7-18.1 GHz to stations in the fixed-satellite service (Earth-to-space) in Region 2 in the band 17.8-18.1 GHz and to stations in the broadcasting-satellite service in Region 2 in the band 17.3-17.8 GHz when frequency assignments …. are involved | **AP30A-25****Article 7(REV.WRC-12)**Coordination, notification and recording …frequency assignments to stations in the fixed-satellite service (space-to-Earth) in Region 1 in the band 17.3-18.1 GHz and in Regions 2 and 3 in the band 17.7-18.1 GHz, to stations in the fixed-satellite service (Earth-to-space) in Region 2 in the band 17.8-18.1 GHz and to stations in the broadcasting-satellite service in Region 2 in the band 17.3-17.8 GHz when frequency assignments … are involved |
| 77 | A | 654 | **AP30A-26**7.5 In the case of Regions 1 and 3, an administration … under § 7.2 shall, within … to the Bureau for information. | **AP30A-26**7.5 In the case of Regions 1 and 3, an administration … under § 7.3 shall, within … to the Bureau for information. |
| 78 | F | 797 | **AP30B-31**1.7.3 La température de bruit du système de réception de la station spatiale à la sortie de l'antenne de réception est la suivante: 1 000 K pour la bande des 6 GHz; 1 500 K pour la bande des 13 GHz. | **AP30B-31**1.7.3 La température de bruit du système de réception de la station spatiale à la sortie de l'antenne de réception est la suivante: 500 K pour la bande des 6 GHz; 550 K pour la bande des 13 GHz. |
| 79 | A | 809 | AP 42 - V4A-V4Z Saint Kitts and Nevis | AP 42 - 4WA-4WZ Saint Kitts and Nevis (Federation of) |
| 80 | A | 810 | AP 42 - 4WA-4WZ Democratic Republic of Timor-Leste | AP 42 - 4WA-4WZ Timor-Leste (Democratic Republic of)WRC-07 should be WRC-03 |
| 81 |  | **Vol. 3** | Resolutions | Resolutions |
| 82 | All | 59 | **RESOLUTION 49 (REV. WRC-12)***resolves* 6 that if the complete due diligence information is not received by the Bureau before the expiry date specified in *resolves* 2 or 2*bis* above, ... | **RESOLUTION 49 (REV. WRC-12)***resolves* 6 that if the complete due diligence information is not received by the Bureau before the expiry date specified in *resolves* 2, 2*bis* or 3 above, ... |
| 83 |  | **Vol. 4** | ITU-R Recommendations incorporated by reference | ITU-R Recommendations incorporated by reference |
| 84 | C | 314 | **6** 当使用H3E或J3E类发射时，以任何离散频率提供给天线发射口的无用发射功率，当发信机工作在全峰值包络功率时，应符合下表要求：a) 1982年以前安装的发信机 | **6** 当使用H3E或J3E类发射时，以任何离散频率提供给天线发射口的无用发射功率，当发信机工作在全峰值包络功率时，应符合下表要求：a) 1982年1月2日以前安装的发信机 |

### 2.2.2 Inconsistencies, provisions that are lacking clarity

There are still some inconsistencies in the 2012 edition. Some of these inconsistencies are summarized in Table 2, with a view to bringing them to the attention of WRC‑15 which may wish to decide on a corrective action. Examples of other inconsistencies are given in Section 3 of this document. Further clarifications are given in Section 5 of this document.

Table 2

Inconsistencies in the RR, provisions that are lacking clarity

| # | Language | Page – provision | Nature of inconsistency | Possible corrective action |
| --- | --- | --- | --- | --- |
| 1 |  | Volume, page | ARTICLES/APPENDIX | ARTICLES/APPENDIX |
| 2 |  | Volume 1 | Article 5 | Article 5 |
| 3 | All | 89 | 5.279A The use of this band by sensors in the Earth exploration-satellite service… | 5.279A The use of the band 432-438 MHz by sensors the Earth exploration-satellite service… |
| 4 | All | 120 | **5.432** *Different category of service:*in Korea (Rep. of), Japan and Pakistan, the allocation of the band 3 400-3 500 MHz to the mobile, except aeronautical mobile, service is on a primary basis (see No. **5.33**). (WRC‑2000) | To move this footnote from the bottom of the box of the Table (i.e. Region 3, 3 400-3 500 MHz) and to place it next to “Mobile”, since it applies to the mobile service only |
| 5 | S | 287 | In the Spanish version of the RR there is a discrepancy in the Title of Section VI of Article 22. In Arabic, Chinese, Russian, French and English versions Section VI refers to the off-axis power limits on earth stations of a geostationary-satellite network in the fixed-satellite service33, 34 (WRC-2000), while the Spanish version refers to non-GSO satellite network. | Sección VI – Limitaciones de la potencia fuera del eje de las estaciones terrenas de red de satélites geoestacionarios del servicio fijo por satélite33, 34     (CMR‑2000) |
| 6 | All | 403 | 4 52.221.3 The carrier frequencies 4 125 kHz, 6 215 kHz, 8 291 kHz, 12 290 kHz and 16 420 kHz are also authorized for common use by coast and ship stations for single-sideband radiotelephony on a simplex basis for distress and safety traffic. | Frequency 8 291 kHz is contained in Note 4 (52.221.3). However, this frequency is not referenced in provision 52.221. |
| 7 |  | Volume 1 | Article 11 | Article 11 |
| 8 | All | 210 | **11.48** | Inconsistency between 11.48 & para 8 of Annex 1 to Res 552, 30 days after 7 years should be added to 11.48 |
| 9 |  | Volume 2 | Appendix 4 | **Appendix 4** |
| 10 | All | 87 | B.3.e | A + symbol should be added for Appendix 30 submissions. |
| 11 |  | Volume 3 | Resolutions and Recommendations | **Resolutions and Recommendations** |
| 12 | All | 309 | RESOLUTION 608 (WRC-03)Use of the frequency band 1 215-1 300 MHz by systems of the radionavigation-satellite service (space-to-Earth | Add a note by the Secretariat referred to Sudan in *recognizing* 2, indicating its partition into two independent States in 2011. |

### 2.2.3 Outdated provisions

The 2012 edition of the RR contains several provisions, especially Article 5, which make reference to past dates. In some cases, these past dates define the period of validity of a frequency allocation and the concerned provisions are now obsolete (or will become obsolete by the end of WRC‑15).

Table 3 contains a list of some RR texts that may require updates and they are brought to the attention of WRC‑15, for consideration and for undertaking appropriate updates, where required.

Table 3

Texts in the RR that may require updates

| # | Page | Current RR text that may require update | Possible course of action |
| --- | --- | --- | --- |
| 1 | Volume 1, ARTICLE 5 |
| 2 | 81 | 5.224A The use of the bands 149.9-150.05 MHz and 399.9-400.05 MHz by the mobile-satellite service (Earth-to-space) is limited to the land mobile-satellite service (Earth-to-space) until 1 January 2015.     (WRC-97) | Suppress because of reference to past date. Restriction on use will be obsolete at time of WRC-15 |
| 3 | 81 | 5.224B The allocation of the bands 149.9-150.05 MHz and 399.9-400.05 MHz to the radionavigation-satellite service shall be effective until 1 January 2015.     (WRC-97) | Suppress because of reference to past date. Allocation will be obsolete at time of WRC-15.(Consequential MOD/SUP also required to Nos. **5.220**, **5.222**, **5.223**, **5.260** and AP**7**) |
| 4 | 94 | 5.312 *Additional allocation*:  in Armenia, Azerbaijan, Belarus, the Russian Federation, Georgia, Kazakhstan, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan and Ukraine, the band 645-862 MHz, in Bulgaria the bands 646-686 MHz, 726-758 MHz, 766-814 MHz and 822-862 MHz, in Romania the band 830-862 MHz, and in Poland, the band 830-860 MHz until 31 December 2012 and the band 860-862 MHz until 31 December 2017, are also allocated to the aeronautical radionavigation service on a primary basis.    (WRC‑12) | Modify since the some portion of the bands of additional allocation is referenced to past date. Allocation will be obsolete at time of WRC-15. |
| 5 | 94 | 5.313A …. In China, the use of IMT in this band will not start until 2015. | Modify the footnote because of reference to 2015. |
| 6 | 94 | 5.316 *Additional allocation:*  in Germany, Saudi Arabia, Bosnia and Herzegovina, Burkina Faso, Cameroon, Côte d'Ivoire, Croatia, Denmark, Egypt, Finland, Greece, Israel, Jordan, Kenya, Libya, The Former Yugoslav Republic of Macedonia, Liechtenstein, Mali, Monaco, Montenegro, Norway, the Netherlands, Portugal, the United Kingdom, the Syrian Arab Republic, Serbia, Sweden and Switzerland, the band 790-830 MHz, and in these same countries and in Spain, France, Gabon and Malta, the band 830-862 MHz, are also allocated to the mobile, except aeronautical mobile, service on a primary basis. However, stations of the mobile service in the countries mentioned in connection with each band referred to in this footnote shall not cause harmful interference to, or claim protection from, stations of services operating in accordance with the Table in countries other than those mentioned in connection with the band. This allocation is effective until 16 June 2015.     (WRC‑07) | Suppress because of reference to past date. Additional allocation will be obsolete at time of WRC-15 |
| 7 | 95 | 5.316A *Additional allocation:*  in Spain, France, Gabon and Malta, the band 790-830 MHz, in Albania, Angola, Bahrain, Benin, Botswana, Burundi, Congo (Rep. of the), Egypt, United Arab Emirates, Estonia, Gambia, Ghana, Guinea, Guinea-Bissau, Hungary, Iraq, Kuwait, Lesotho, Latvia, Lebanon, Lithuania, Luxembourg, Malawi, Morocco, Mauritania, Mozambique, Namibia, Niger, Nigeria, Oman, Uganda, Poland, Qatar, Slovakia, Czech Rep., Romania, Rwanda, Senegal, Sudan, South Sudan, South Africa, Swaziland, Tanzania, Chad, Togo, Yemen, Zambia, Zimbabwe and French overseas departments and communities of Region 1, the band 790-862 MHz and in Georgia, the band 806-862 MHz, are also allocated to the mobile, except aeronautical mobile, service on a primary basis subject to the agreement by the administrations concerned obtained under No. **9.21** and under the GE06 Agreement, as appropriate, including those administrations mentioned in No. **5.312**, where appropriate. See Resolutions **224 (Rev.WRC‑12)** and **749 (Rev.WRC‑12)**. This allocation is effective until 16 June 2015.    (WRC‑12) | Suppress because of reference to past date. Additional allocation will be obsolete at time of WRC-15 |
| 8 | 95 | 5.316B In Region 1, the allocation to the mobile, except aeronautical mobile, service on a primary basis in the frequency band 790-862 MHz shall come into effect from 17 June 2015 and shall be subject to agreement obtained under No. **9.21** with respect to the aeronautical radionavigation service in countries mentioned in No. **5.312**. For countries party to the GE06 Agreement, the use of stations of the mobile service is also subject to the successful application of the procedures of that Agreement. Resolutions **224 (Rev.WRC‑12)** and **749 (Rev.WRC‑12)** shall apply, as appropriate.    (WRC‑12) | Modify because the text of footnote may require updating at WRC-15 due to a lapsed date. |
| 9 | 104 | 5.362B *Additional allocation:* The band 1 559-1 610 MHz is also allocated to the fixed service on a secondary basis in Algeria, Saudi Arabia, Armenia, Azerbaijan, Belarus, Benin, Cameroon, Russian Federation, Gabon, Georgia, Guinea, Guinea-Bissau, Jordan, Kazakhstan, Libya, Lithuania, Mali, Mauritania, Nigeria, Uzbekistan, Pakistan, Poland, the Syrian Arab Republic, Kyrgyzstan, Dem. People’s Rep. of Korea, Romania, Senegal, Tajikistan, Tanzania, Tunisia, Turkmenistan and Ukraine until 1 January 2015, at which time this allocation shall no longer be valid. Administrations are urged to take all practicable steps to protect the radionavigation-satellite service and the aeronautical radionavigation service and not authorize new frequency assignments to fixed-service systems in this band.     (WRC‑12) | Suppress because of reference to past date. Allocation will be obsolete at time of WRC-15 |
| 10 | 104 | 5.362C *Additional allocation:* in Congo (Rep. of the), Eritrea, Iraq, Israel, Jordan, Qatar, the Syrian Arab Republic, Somalia, Sudan, South Sudan, Chad, Togo and Yemen, the band 1 559-1 610 MHz is also allocated to the fixed service on a secondary basis until 1 January 2015, at which time this allocation shall no longer be valid. Administrations are urged to take all practicable steps to protect the radionavigation-satellite service and not authorize new frequency assignments to fixed-service systems in this band.    (WRC‑12) | Suppress because of reference to past date. Allocation will be obsolete at time of WRC-15 |
| 11 | 129 | 5.458C Administrations making submissions in the band 7 025-7 075 MHz (Earth-to-space) for geostationary-satellite systems in the fixed-satellite service after 17 November 1995 shall consult on the basis of relevant ITU‑R Recommendations with the administrations that have notified and brought into use non-geostationary-satellite systems in this frequency band before 18 November 1995 upon request of the latter administrations. This consultation shall be with a view to facilitating shared operation of both geostationary-satellite systems in the fixed-satellite service and non-geostationary-satellite systems in this band. | Suppress 5.458C because there are no NGSO systems before 18 Nov 1995 |
| 12 | 173 | 5.562D *Additional allocation*:  In Korea (Rep. of), the bands 128-130 GHz, 171-171.6 GHz, 172.2-172.8 GHz and 173.3-174 GHz are also allocated to the radio astronomy service on a primary basis until 2015.     (WRC‑2000) | Suppress because of allocation is “until 2015”. Ambiguous as to when in 2015. Does the allocation expire or terminate on January 1, 2015? Regardless, the allocation will no longer be relevant in next edition of the RR. (Also need to consider if consequential amendments are required to No. **5.149** and its application in the Table in the bands 123-130 GHz and 167-174.5 GHz) |
| 13 | Volume 2, APPENDICES |
| 14 | 489 | AP30-134.2.614 The provisions of Resolution **533 (Rev.WRC‑2000)** apply.  (WRC‑03) | AP30-134.2.614 The provisions of Resolution 533 (Rev.WRC‑2000)\*\* apply.  (WRC‑03)\*\* *Note by the Secretariat*: This Resolution was abrogated by WRC-12. |
| 15 | 567 | **AP30-91**ANNEX 126 For the protection of analogue assignments brought in service before 17 October 1997, the following values shall be used until 1 January 2015:–147 dB(W/(m2 ⋅ 27 MHz)) for 0° ≤ θ < 0.44°–138 + 25 log θ dB(W/(m2 ⋅ 27 MHz)) for 0.44° ≤ θ < 9°. | **AP30-91**ANNEX 1Reason: Suppress because of reference to past date. |
| 16 | 583, 584 | **AP30-107/108**ANNEX 433 For the protection of analogue assignments brought into service before 17 October 1997, the following values shall be used until 1 January 2015:–147 dB(W/(m2 ⋅ 27 MHz)) for 0° ≤ θ < 0.44°–138 + 25 log θ dB(W/(m2 ⋅ 27 MHz)) for 0.44° ≤ θ < 9°. | **AP30-107/108**ANNEX 4Reason: Suppress because of reference to past date. |
| 17 | 694 | **AP30A-66**32 The power control values will be calculated after WRC-2000. | **AP30A-66**Reason: Power control values have been calculated and communicated to all administrations via Circular Letter CR/356. |
| 18 | 770 | **AP30B** - Article 6 Note 11 …See also Resolution **905 (WRC-07)**. | **AP 30B** - Article 6 Note 11 …See also Resolution **905 (WRC-07)** \*\*.\*\* *Note by the Secretariat:* This Resolution was abrogated by WRC-12. |

## 2.3 Considerations concerning the preparation of future editions of the RR

**2.3.1** For the preparation of the 2012 edition of the RR the Bureau followed the previous practices, especially with respect to the content of Volume 3, notably:

– only the most recent version of a provision, Resolution or Recommendation was included in the 2012 edition of the Radio Regulations, with the understanding that the most recent version cancels and replaces all of the former versions of the same provision, Resolution or Recommendation;

– that the suppressed Resolutions and Recommendations become ineffective at the time of the signing of the final acts of a conference and, consequently, thus they could not be included in the forthcoming edition of the Radio Regulations, irrespective of whether they are referred to in some of the regulatory provisions in force, or not.

The conference may consider reviewing systematically the references in the Radio Regulations to old or suppressed versions of previous WRC Resolutions or Recommendations.

**2.3.2** In the preparation of Volume 4 of the 2012 edition of the RR, the Bureau experienced some difficulties, given the fact that some provisions of the RR seem to have a mandatory character, or make reference to other texts that seem to have a mandatory character, but no explicit decision was taken by WRC-12 as to whether the referenced ITU-R Recommendations were to be included in Volume 4 or not. According to the Bureau’s understanding, the procedures applicable for the incorporation by reference of an ITU-R Recommendation are specified in Resolution **27 (Rev.WRC-07)** and more specifically in its Annex 3. It is up to the delegations, at WRC, to propose which ITU-R Recommendations will be included in Volume 4 and the proposals need to be approved by the Conference in a standard manner (white document, blue document, pink document, or with a specific decision by the Plenary recorded in the Minutes of the Plenary). In order to avoid any ambiguities of this kind, it may be appropriate, for each WRC, to approve the contents of Volume 4 of the forthcoming edition of the Radio Regulations.

### 2.4 Changes resulting from the partition of Sudan into two countries

In view of the partition of the ITU Member State Sudan (Republic of the) into two separate states namely Republic of the Sudan and Republic of South Sudan, the Bureau implemented several follow-up actions to reflect the new situation. These actions covered the relevant updates of the frequency assignments/ allotments recorded in the Master Register and various Plans, additional allocation of means of identification of radio stations to South Sudan and the related updates in BR’s geographical and administrative databases.

WRC-12 made consequential changes of country names in a number of footnotes of Article 5. Nevertheless, some of the follow-up actions were made after WRC-12 and therefore not reflected in the 2012 edition of the Radio Regulations.

For this reason, the Conference is invited to approve the following updates of the RR, resulting from the partition of former Sudan (Republic of the):

– Appendix 26: to retain 7 frequency allotments on 3 104 kHz, 3 927 kHz, 4 733 kHz, 6 748 kHz, 11 175 kHz, 13 209 kHz and 15 097 kHz and delete allotments on 5 720 kHz, 8 992 kHz, and 18 027 kHz for Sudan. To add 6 frequency allotments on 3 062 kHz, 3 915 kHz, 4 712 kHz, 5 720 kHz, 8 992 kHz and 18 027 kHz for South Sudan;

– Appendix 42: to add call sign series Z8A – Z8Z for South Sudan;

– Resolution **608 (WRC-03)**: to add a Note by the Secretariat referred to Sudan in *recognizing* 2 indicating its partition into two independent States in 2011.

# 3 Experience in the application of the radio regulatory procedures

This section summarizes the experiences of the Bureau in the application of the procedures referred to in Articles, Appendices, Resolutions and Recommendations of the RR, where appropriate. It also contains summaries on some of the issues raised at RRB meetings which, in the opinion of the RRB, may require consideration by the Conference.

## 3.1 Comments relating to RR Article 5

### 3.1.1 Introduction of a new class of station, code UC, for an earth station while in motion associated with a space station in the fixed-satellite service in the bands listed under RR No. 5.526

Administrations wishing to operate satellite networks under RR No. **5.526** have requested the ability to distinguish links with earth stations while in motion in the fixed-satellite service (FSS) from other links in advance publication information (API), coordination request under RR No. **9.7** and notification information under RR Article **11**.

No. **5.526** reads as follows:

 5.526 In the bands 19.7-20.2 GHz and 29.5-30 GHz in Region 2, and in the bands 20.1-20.2 GHz and 29.9-30 GHz in Regions 1 and 3, networks which are both in the fixed-satellite service and in the mobile-satellite service may include links between earth stations at specified or unspecified points or while in motion, through one or more satellites for point-to-point and point-to-multipoint communications.

Under this provision, links between an earth station in motion (i.e. an earth station at an unspecified point) and an associated space station in the fixed-satellite service are permitted, as long as the satellite network is both in the FSS and in MSS. In particular, it is noted that if the space station includes an EC (class of space station in the FSS) and an EI (class of space station in the MSS) space station classes in the same or different beams and operating in the same or different parts of the frequency ranges mentioned in No. **5.526**, the condition stated above is fulfilled.

In order to process satellite network filing submissions by administrations under No. **5.526**, the Bureau has defined a new class of station for Table 3 in the Preface to the BR IFIC (Space Services), as follows:

UC – earth station while in motion in the fixed-satellite service in the bands listed under provision No. **5.526**.

Administrations were informed of this action, through Circular Letter CR/358, and were invited to use the new class of station symbol when submitting a filing for a satellite network which is both in the FSS and in the MSS for links between a space station in the FSS and an earth station while in motion using frequency assignments in the bands 19.7-20.2 GHz and 29.5-30.0 GHz in Region 2 and in the bands 20.1-20.2 GHz and 29.9-30.0 GHz in Regions 1 and 3 in conformity with the specific FSS allocations and conditions specified in No. **5.526**. As a consequence, the link between a space station in the FSS and an earth station while in motion may be registered under the relevant coordination and subsequent notification procedures in conformity with the specific FSS bands and conditions specified in No. **5.526**.

To establish coordination requirements for links associated with the UC class of earth station, the Bureau is using the existing criteria for FSS links in the bands 19.7-20.2 GHz and 29.5-30.0 GHz.

Regarding the ITU-R Study Group (SG) activities relating to this issue, SG 4 already approved Reports ITU-R S.2223 (Technical and operational requirements for GSO FSS earth stations on mobile platforms in bands from 17.3 to 30.0 GHz), ITU-R S.2261 (Technical and operational requirements for earth stations on mobile platforms operating in non-GSO FSS systems in the frequency bands from 17.3 to 19.3, 19.7 to 20.2, 27 to 29.1 and from 29.5 to 30.0 GHz) and ITU‑R S.2357 (Technical and operational guidelines for earth stations on mobile platforms communicating with geostationary space stations in the fixed-satellite service in the frequency bands 19.7-20.2 GHz and 29.5-30.0 GHz), Working Party (WP) 4A continues to study earth stations in motion communicating with GSO and non-GSO space stations in the FSS, as reflected in various annexes to reports of the Chairman.

In accordance with CR/358, for a satellite network that would include different beams with frequency assignments operating in the FSS, i.e. EC class of space station, in all frequency ranges indicated in No. **5.526**, in order for earth stations while in motion (UC class of earth station) to be taken into account in these beams, the requirement would be for the satellite network to include at least one beam in one part of the No. **5.526** frequency ranges allocated to the MSS with frequency assignments associated to EI class of space station (or EG, EJ, EU). In other words, the new UC class of earth station may operate in any EC beam associated with the relevant space station in the frequency bands referred to in No. **5.526**, regardless of whether there is an EI designation associated with that beam, and to the extent that at least one EI beam is part of the satellite network.

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| The Conference is invited to consider the above approach and to take any relevant decisions, as it may wish. |

### 3.1.2 RR No. 5.511A, No. 5.511D

At its May 2013 meeting, Working Party 4A received a document associated with WRC-15 agenda item 9.2 and this document was retained as Annex 32 to the Chairman’s Report of that meeting (Document [4A/242](http://www.itu.int/md/R12-WP4A-C-0242/en)). The document that was received included a review of the provisions associated with the use of the band 15.4-15.7 GHz by the fixed-satellite service with a view of removing an ambiguity associated with coordination of fixed-satellite service (FSS) and terrestrial networks under RR No. **9.14**. The document offers possible solutions intended to remove any outdated provision associated with the FSS allocation in the 15.4 15.7 GHz band, and formulates recommendations on the best approach to deal with the issues raised. At its October 2013 meeting, the Working Party agreed that this issue should be brought to the attention of the Director, Radiocommunication Bureau, for consideration.

The use of the FSS (space-to-Earth) primary allocation in the band 15.43-15.63 GHz is limited to feeder links of non-geostationary systems in the mobile-satellite service for which API has been received by the Bureau prior to 2 June 2000 as per RR No. **5.511A**. Furthermore, RR No. **5.511D** only applies to FSS networks for which API has been received by 21 November 1997.

Considering that the dates indicated in RR Nos. **5.511A** and **5.511D** have since passed (by over fifteen years), it appears that the only reason that may justify retaining unchanged the above-mentioned provisions would be the existence of recorded FSS assignments in any parts of the bands 15.4-15.43 GHz and 15.63-15.7 GHz as per RR No. **5.511D** and FSS (space-to-Earth) assignments in any parts of the band 15.43-15.63 GHz as per RR No. **5.511A**.

As of end June 2015, there is no recorded FSS assignment in the band 15.4-15.7 GHz.

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| The Conference may wish to consider this issue for which an exhaustive list of possible options is provided in Annex 32 to Document [4A/242](http://www.itu.int/md/R12-WP4A-C-0242/en) (23 May 2013).  |

### 3.1.3 RR No. 5.511F

At WRC-12, under agenda item 1.21, new footnote No. **5.B121** was approved to address the compatibility between the radiolocation service in the frequency band 15.4-15.7 GHz and the passive services in the frequency band 15.35-15.4 GHz. This footnote became footnote No. **5.511F** in the RR:

 5.511F In order to protect the radio astronomy service in the frequency band 15.35-15.4 GHz, radiolocation stations operating in the frequency band 15.4-15.7 GHz shall not exceed the power flux-density level of −156 dB(W/m2) in a 50 MHz bandwidth in the frequency band 15.35‑15.4 GHz, at any radio astronomy observatory site for more than 2 per cent of the time.     (WRC 12)

In order to take into account the concerns expressed during WRC-12 on the 2% of the time criterion, the following text was inserted in the Minutes of the 8th WRC-12 Plenary Meeting (see sections 16.4 to 16.8 of WRC-12 Doc. 549):

“Some delegations argued for removing the phrase “for more than 2 percent of the time” from footnote No. **5.B121**. The percentage of data loss for radio astronomy is the subject of Recommendation ITU-R RA.1513, the revision of which should be undertaken during the next ITU‑R study cycle. These studies should take into account that in this case the No. **5.B121** refers to a band labelled with No. **5.340**, for which interference thresholds are given in Recommendation ITU‑R RA 769. Furthermore, it should be studied what the operational consequences for the radiolocation service are, in case the phrase: “for more than 2 % of the time” would not be included in the footnote No. **5.B121**. The conclusions of these studies should be included in the report from the Director of the Radiocommunication Bureau to WRC-15, allowing WRC-15 to decide whether or not the words “for more than 2 per cent of the time” should be deleted from the footnote **5.B121**.”

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| After WRC-12 the concerned ITU-R Working Parties carefully reviewed the issue and came to the conclusion that no change to RR No. **5.511F** is required to be made at WRC-15. |

## 3.2 Comments relating to coordination, notification and recording of frequency assignments, aeronautical services, appendices and resolutions

WRC-12 examined the report on the experiences, difficulties and inconsistencies experienced by the Bureau (WRC-12 Doc. 4, Addendum 2) and agreed on appropriate mechanisms for fixing many of the reported problems. For some items, because of lack of time and insufficient studies by administrations, WRC-12 concluded that no change was needed at that conference; however, it indicated that administrations might wish to study the suggestions contained in the Director’s Report in time for the next conference. The Bureau carried out a review of such issues and, taking account of their continued relevance, is listing such issues as well as new ones for possible consideration by the Conference.

### 3.2.1 Still relevant difficulties and inconsistencies in the Director’s Report to WRC-12

Difficulties and inconsistencies identified in the Director’s Report to WRC-12 related to space services that have not been addressed by WRC-12 or included in the CPM Report for WRC‑15 that are still relevant and could be considered by WRC-15 (agenda item 9), are given below.

#### 3.2.1.1 Application of RR No. 9.11A and its relationship with RR Appendix 5 and the corresponding data requirements (WRC12 Doc. 4(Add.2), § 3.3.2.1)

RR Appendix **5**, paragraph 1 states that “For the purpose of effecting coordination under Article 9 … the frequency assignments to be taken into account are those in the same frequency band as the planned assignment, pertaining to the same service or to another service to which the band is allocated with equal rights or higher category1 of allocation …”. Footnote 1 restricts this application to assignments in bands allocated with equal rights in case of coordination under RR Nos. **9.15**-**9.19**. The Radio Regulations Board considered the application of coordination under RR Nos. **9.11A**-**9.14** between frequency assignments in bands allocated with different category of allocation and taking into account RR Nos. **5.28**-**5.31**, it confirmed the practice applied by the Bureau since 1992 to examine coordination under RR Nos. **9.11A**-**9.14** between services with equal status only (see Table 1 to RS46 Rule of Procedure (Edition 1994)). Noting however the text in paragraph 1 to Appendix **5**, the Board considers that the attention of a future conference should be drawn to this discrepancy. (Refer to RRB 24th meeting (10-18 September 2001)) with a view to including the substance of the above rule of procedure in the Radio Regulations.

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| Examples of drat texts for possible consideration by the Conference are presented below:Option 1: MOD note 1 to Appendix 5 of the Radio Regulations:1 The coordination under Nos. 9.11A to 9.19 applies only to assignments in bands allocated with equal rights.Option 2: MOD §1 to Appendix 5:1 For the purpose of effecting coordination under Article 9, except in the case under No. 9.21, and for identifying the administrations with which coordination is to be effected, the frequency assignments to be taken into account are those in the same frequency band as the planned assignment, pertaining to the same service or to another service to which the band is allocated with equal rights, which might affect or be affected, as appropriate, and which are: |

#### 3.2.1.2 Submission of a method to meet power-flux density (pfd) limits for steerable beams in accordance with the Rules of Procedure relating to RR No. 21.16 (WRC‑12 Doc. 4 (Add.2), § 3.3.6)

Paragraph 3 of the Rules of Procedure relating to RR No. **21.16** requires that in cases where frequency assignments in steerable beams of a satellite network exceed the applicable hard pfd limits, the Bureau will establish a favourable finding only if:

i) there is at least one position of the steerable beam where the applicable pfd limits are met without any reduction of the notified power density;

ii) the administration states that the applicable pfd limits will be met by applying a method, the description of which should be submitted to the Bureau. One possible example of such a method is described in the Annex to this Rule.

Although this Rule of Procedure has been in force since 1998, the Bureau notes that there are administrations that are still unaware or continue to overlook these requirements when submitting notices for coordination request and notification.

As a result, frequency assignments of the steerable beams receive unfavourable findings, thus detrimentally impacting the administration’s effort to coordinate and record these frequency assignments.

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| In view of the above, the Bureau would like to propose the Conference to include the said requirement in Appendix 4 of the Radio Regulations so as to aid administrations in complying with the requirements when submitting notices for coordination request and notification. |

#### 3.2.1.3 Relocation of satellites (WRC12 Doc. 4 (Add.2), § 3.3.6)

The Radiocommunication Bureau has received requests for assistance regarding unidentified spacecraft located in proximity to the orbit of a satellite network recorded in the MIFR and operating in conformity with the RR. Considering the risk of a physical collision and also of harmful interference, the Bureau requested potentially involved administrations to kindly verify the presence of any of their satellite networks located around the orbit of the recorded satellite network, and to provide information, including contact details of operating agencies, relating to the relevant satellite networks directly to the affected administration with a copy to the Bureau.

The Bureau is concerned about witnessing a situation in which the drifting of satellites around the geostationary-satellite orbit is not advertised with the administrations operating satellite networks in the GSO arc of interest duly recorded in the Master Register, and also worried about possible cases of harmful interference and risk of physical collision. In that regard, the Conference may wish to encourage administrations to exchange information with concerned administrations on movement of satellites from one orbital location to another and to mandatorily keep the Bureau informed in order to prevent such above-mentioned situations. The Bureau could then assist administrations by informing concerned administrations by, for example, a circular telegram and/or posting the information on the website.

#### 3.2.1.4 Launch vehicles and suborbital flights (WRC12 Doc. 4 (Add.2), § 3.3.9)

Some administrations have applied the procedure of Article 9 of the Radio Regulations for recording in the MIFR frequency assignments for satellite launch vehicles. One particular API submission included different orbital planes intended to represent the different types of launch that are possible from a specific launch facility taking account that only one orbital plan was actually used when a launch takes place and that all the carriers in this system were received and emitted only during the flight phases of these launch vehicles, which last between 30 minutes and three hours.

In addition to satellite launchers, the Bureau is witnessing increasing activities and projects under development using suborbital flight vehicles. These objects are not intended to remain in outer space for a long period. Indeed this time may vary from few minutes or hours up to few days before returning back to Earth.

Several administrations have queried the Bureau on this matter and one filing for a non-GSO satellite network has so far been received by the Bureau and published in May 2015 for a multi-satellite deployment system which is located at the upper stage of a launcher.

Suborbital flights may encompass today a wide range of technologies and operational usage, for example:

– sub‑orbital plane carrying passengers, taking off from a standard airport which will reach altitude around 100 km and after remaining in this altitude for a few minutes will land at the same airport;

– sub‑orbital plane carrying passengers half way around the world, taking off from a standard airport which will fly several hours in altitudes close to 100/120 km and will land at a standard airport on a different continent;

– hybrid space plane technology based on hybrid jet or rocket engines intended to launch a spacecraft to reach outer space orbit, and after releasing the spacecraft accelerate away and land on Earth as a sub-orbital space flight;

– upper stage rocket or launch vehicle satellite deployer carrying a number of small satellites roaming in the close outer space orbit for several hours intended to launch satellites to reach outer space orbit and after releasing these satellites burning out in the Earth’s atmosphere…

From the technical description, operational parameters as well as spectrum requirements, these new projects may not be fitting with the current aeronautical or space service regulatory description and associated procedures for the international recognition of the used of relevant frequency assignments. Administrations however should be encouraged to record the frequency assignments used by such stations.

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| In this regard, the Conference may wish to consider the relevance of existing definitions, service allocations and procedures to be applied and information to be provided for such stations or vehicles and review them accordingly and also to encourage administrations to record the frequency assignments used by such stations. |

### 3.2.2 Article 9 of the Radio Regulations

#### 3.2.2.1 Application of RR No. 9.19 to terrestrial services

RR No. **9.19** is related to coordination of transmitting terrestrial stations vis-à-vis typical earth station included in the service area of a space station in the broadcasting-satellite service in the bands shared with equal rights between these services.

RR Appendix **5** states that the following frequency bands shall be subject to coordination under No. **9.19**: 620-790 MHz, 1 452-1 492 MHz, 2 310-2 360 MHz, 2 520-2 670 MHz, 11.7-12.75 GHz, 17.7-17.8 GHz, 40.5-42.5 GHz and 74-76 GHz. Appendix **5** also specifies that the thresholds triggering coordination under No. **9.19** are the necessary bandwidths overlap and the pfd value at the edge of the BSS service area exceeding the permissible level.

Currently, the threshold values are available only for the band 11.7-12.7 GHz and contained in Annex 3 of RR Appendix **30**. For all other bands the ITU-R documents do not contain information on the threshold values and the methodology for calculating pfd at the edge of the service area.

It may be noted that the Rules of Procedure on No. **9.19** instruct that until such time as a calculation method and technical criteria are included in the relevant ITU R Recommendation(s), in applying this provision for the identification of affected administrations, the Bureau, in addition to the frequency overlap examination, would also use, on a provisional basis, the power flux-density limits in the nearest frequency band(s), where available.

Since the pfd threshold values are only available for the band 11.7-12.7 GHz, and given the fact that different propagation conditions and criteria may apply to the other bands, in examination of frequency notices for terrestrial stations under No. **9.19** the Bureau currently establishes coordination requirements using only frequency overlap as the coordination threshold.

The Conference may wish to consider this Bureau’s practice and confirm it or give necessary instructions to the relevant Study Groups to identify the applicable pfd values and calculation methods for establishing coordination requirements under No. **9.19** in the relevant frequency bands.

#### 3.2.2.2 Comments relating to application of RR No. 9.21 to terrestrial services

The RR contain 30 footnotes referring to No. **9.21** that are applicable to terrestrial services: RR Nos. **5.61**, **5.87A**, **5.92**, **5.93**, **5.123**, **5.177**, **5.181**, **5.190**, **5.197**, **5.225A**, **5.251**, **5.252**, **5.259**, **5.279**, **5.292**, **5.293**, **5.297**, **5.309**, **5.316A** (until 16 June 2015), **5.316B** (from 17 June 2015), **5.322**, **5.323**, **5.325**, **5.326**, **5.410**, **5.430A**, **5.431A**, **5.432B**, **5.447** and **5.482**. The Bureau would like to draw the Conference’s attention to two aspects of the application of these footnotes by administrations.

Firstly, since the establishment of this procedure (initially as Article **14** to the Radio Regulations and thereafter as a procedure under No. **9.21**) at WARC-79, no request for the application of this procedure was ever received for 27 provisions that are applicable to terrestrial services. Only requests for the application of RR Nos. **5.177**, **5.316A** and **5.323** were received. During the reporting period (2012-2015), the requests for the application of the procedure under No. **9.21** were related only to Nos. **5.177** and **5.316A**.

Secondly, the criteria for identification of affected administrations required for the application of the 9.21 procedure are fully or partially available only for 15 provisions, namely Nos. **5.61**, **5.92**, **5.93**, **5.87A**, **5.123**, **5.225A**, **5.292**, **5.293**, **5.297**, **5.309**, **5.316A**, **5.316B**, **5.323**, **5.325** and **5.326**. These criteria are contained either in the footnotes, e.g. No. **5.225A**, or WRC Resolutions, e.g. Resolution **749 (Rev.WRC-12)**, or Part B6 of the Rules of Procedures. For other provisions such criteria are missing.

In this respect, the Bureau notes that the CPM Report to WRC-15 contains a number of proposed allocations subject to agreement obtained under No. **9.21**. These proposals are included in the following sections of the Report: 1/1.1/6.1 (470-694/698 MHz), 1/1.1/6.3 (1 427-1 452 MHz), 1/1.1/6.4 (1 452-1 492 MHz), 1/1.1/6.5 (1 492-1 518 MHz), 1/1.1/6.6 (1 518-1 525 MHz), 1/1.1/6.8 (2 700-2 900 MHz), 1/1.1/6.10 (3 400-3 600 MHz), 1/1.1/6.11 (3 600-3 700 MHz), 1/1.1/6.12 (3 700-3 800 MHz), 1/1.1/6.13 (3 800-4 200 MHz), 1/1.1/6.15 (4 500-4 800 MHz), 1/1.2/5.2 and 1/1.2/5.3 (694-790 MHz).

Currently, the criteria for identification of affected administrations under No. **9.21** are not available for the cases mentioned in sections 1/1.1/6.3, 1/1.1/6.4, 1/1.1/6.5 and 1/1.1/6.6 for the bands between 1 427 and 1 525 MHz and in section 1/1.1/6.8 for the band 2 700-2 900 MHz. If the above allocations are approved by WRC-15, the Conference is invited to provide the necessary criteria or give instructions to the relevant Study Groups to develop them, in order to enable the Bureau to properly apply the No. **9.21** procedure.

The Conference also may wish to assess whether the pfd value proposed for these footnotes in sections 1/1.1/6.10, 1/1.1/6.11, 1/1.1/6.12, 1/1.1/6.13 and 1/1.1/6.15 of the Report of the Conference Preparatory Meeting (CPM) (Document 3), for the bands between 3 400 and 4 800 MHz can be applied for the identification of affected administrations under No. **9.21** with respect to all protected services or whether it is necessary to develop additional criteria.

#### 3.2.2.3 Rule of Procedure reflecting the practice of the Bureau under RR No. 9.62 of sending a reminder providing an additional fifteen-day period

The Rules of Procedure on RR Nos. **9.47** and **9.62** reflecting the practice of the Bureau under Nos. **9.47** and **9.62** of sending a reminder providing an additional fifteen-day period for the response were approved by the RRB in its 66th meeting (17-21 March 2014) taking into account RR No.**13.12A** b). In approving the Rules, taking into account RR No. **13.12A** g), the RRB instructed the Bureau to bring them to the attention of WRC-15.

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| In view of the above the Conference may wish to incorporate the Rules of Procedure in the Radio Regulations, as follows:MOD9.47 If there is no acknowledgement of receipt within 30 days after the Bureau’s action under No. 9.46, the Bureau shall immediately send a reminder providing an additional fifteen-day period for the response. In the absence of such an acknowledgement within fifteen days, it shall be deemed that the administration which has failed to acknowledge receipt has undertaken:MOD9.62 If the administration concerned fails to respond within thirty days of the Bureau’s action under No. 9.61, the Bureau shall immediately send a reminder providing an additional fifteen-day period for the response. If the administration still fails to respond after the Bureau’s reminder within the fifteen days, the provisions of Nos. 9.48 and 9.49 shall apply. |

In some cases coordination may involve services not allocated with equal status. In these cases, the application of RR No. **9.48** and No. **9.49** in case of non-response to the Bureau’s reminder under RR Nos. **9.47** and **9.62** might contradict the definition of status given in the allocation. For example, when an administration A whose service X shall not cause harmful interference and cannot claim protection from harmful interference to the service Y of Administration B, but may be requested to coordinate with that latter administration, requests assistance of the Bureau in the absence of response of Administration B, the result of the Bureau’s assistance should not result in the service Y of Administration B not to cause harmful interference and claim protection from harmful interference to the service X of Administration A.

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| In view of the above the Conference may wish to consider the following Note to be added to RR Nos. **9.47** and **9.62**.ADD9.47.1 Nos. **9.48** and **9.49** apply when the concerned services are allocated with equal rights and no special condition of the Radio Regulations applies between the services. ADD9.62.1 Nos. **9.48** and **9.49** apply when the concerned services are allocated with equal rights and no special condition of the Radio Regulations applies between the services.  |

#### 3.2.2.4 Submission of coordination requests for non-GSO satellite systems

##### 3.2.2.4.1 Submission of requests for coordination related to non-GSO satellite systems

Since November 2014, the Bureau has received numerous requests for coordination for non-GSO systems operating in the FSS subject to equivalent power flux-density (epfd) limits in Article 22 and to coordination under No. 9.7B of the Radio Regulations.

The submissions by administrations of non-GSO FSS satellite systems may be described in three main categories:

i) satellite systems with one (or more than one) set(s) of orbital characteristics and inclination value(s) with an indication that all frequency assignments of the system would be operated simultaneously;

ii) satellite systems with different sets of orbital characteristics and inclination values with an indication that the different sets of orbit planes would be mutually exclusive, i.e. satellites on these sets of orbits would not be operated simultaneously and only one of these sets of orbit planes and associated inclinations would be implemented and notified for recording in the MIFR;

iii) satellite systems with different sets of orbital characteristics and inclination values without clear indication of the configuration of the non-GSO satellite system to be finally notified and recorded in the MIFR.

For categories 2 i) and 2 ii) above, the Bureau understands that some flexibility may be acceptable at the coordination stage in terms of the planned use of different sets of orbital planes and inclinations to the extent that the different configurations of possible sub-constellations are detailed enough for the coordination discussions with other involved administrations. Also the description of the different sub-configuration of the non-GSO satellite system should allow a proper examination of the submitted coordination requests against the limits in Article 22 of the Radio Regulations including the epfd limits.

The category 2 iii) type of submissions may however be questionable as uncertainty exists with the characteristics of the different sub-sets of the satellite system to be actually coordinated and in terms of the epfd examination to be applied then to all satellites and orbits of the submission. In this regard the Bureau is asking for clarification from the notifying administration on whether frequency assignments will be operated simultaneously with the different sets of orbital parameters (see Section 2.2.2.4.2 of Part I of the Director’s report).

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| In view of the above, the Conference may wish to limit the extent of acceptable flexibility for a request for coordination of a non-GSO satellite system to: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.  |

##### 3.2.2.4.2 Application of Article 22 of the Radio Regulations for the protection of GSO FSS and GSO BSS networks from non-GSO FSS systems

In Part I of the Report of the Director (see Doc 4(ADD.2), Section 2.2.3.5), updated information is provided on the status of the development of the software to validate epfd levels produced by non-GSO FSS with respect to the limits set forth in Article 22.

In addition, Article 21 includes some pfd-limits to protect terrestrial services specifically from non-GSO FSS.

Both Article 22 epfd-limits (and associated Recommendation ITU-R S.1503) and Article 21 pfd-limits have been developed in the study cycle prior to WRC-2000 under certain assumptions with respect to non-GSO FSS constellations planned to be operated at that period.

For the protection of terrestrial service stations in the 17.7-19.3 GHz band, WRC-2000 adopted the following per satellite pfd limits under No.21.16.6:

 −115 − X dB(W/(m2 ·MHz)) for 0° ≤ δ < 5°

 −115 − X + ((10 + X)/20)(δ − 5)) dB(W/(m2 ·MHz)) for 5° ≤ δ < 25°

 −105 dB(W/(m2 ·MHz)) for 25° ≤ δ < 90°

where δ is the angle of arrival above the horizontal plane and X is defined as a function of the number of satellites in the non‑GSO FSS constellation, n, as follows:

 for n ≤ 50 X = 0 (dB)

 for 50 < n ≤ 288 X = (5/119) (n − 50) (dB)

 for n > 288 X = (1/69) (n + 402) (dB)

The scaling function, X, was developed on the basis of non‑GSO FSS constellations with 96, 288 and 840 satellites. Further simulations with different non‑GSO FSS constellations comprising a wide range in the number of satellites (63, 126, 189, 252 and 504 satellites) and using the conservative pfd mask simulation method had confirmed the adequacy of this scaling function. However, in view of some recent submissions of non-GSO systems filings with a number of satellites in the constellation between 1 000 and 70 000, the current limits may become very low and consequently examination of frequency assignments in this frequency band may lead to unfavourable findings.

On the other hand, with regards to the Ku band, the studies at that time were concluding that existing Article 21 per satellite pfd limits were adequate for the protection of the FS in the 10.7‑12.75 GHz band from aggregate interference caused by three assumed non‑homogeneous, non‑GSO FSS systems, therefore no scaling function was introduced.

An administration operating a non-GSO FSS system in compliance with the epfd↓ limits shall be considered as having fulfilled its obligation under No. 22.2 with respect to any GSO networks provided that the epfd↓ radiated in any operating GSO FSS earth stations does not exceed the operational and additional operational limits given in Article 22. These operational and additional operational limits refer to the protection of GSO satellite networks with an orbital inclination of up to 4.5°.

In that context the Bureau understands that these operational and additional operational limits are intended to provide operational protection to GSO FSS networks for orbital inclination of up to 4.5° from interference that may be caused by non-GSO FSS systems subject to the epfd↓ limits of Article 22. Regarding the relationship between GSO FSS and non-GSO FSS systems in these situations, the Bureau also understands that non-GSO FSS systems shall not claim protection from GSO FSS networks irrespective of the orbital inclination values of the GSO networks (up to 15°). Similarly, GSO FSS networks with an orbital inclination greater than 4.5° shall not claim protection from non-GSO FSS networks subject to the epfd↓ limits of Article 22.

Resolution 76 (WRC-2000) resolves that administrations operating or planning to operate non-GSO FSS systems shall take all necessary steps to ensure that the aggregate interference into GSO FSS and GSO BSS networks caused by all non-GSO systems operating co-frequency bands does not cause the aggregate power levels given in the Annex to the resolution to be exceeded.

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| In that context, WRC-15 may wish considering reviewing or confirming the pertinence of the assumptions that lead to the current values of Articles 21 and 22 power limits as well as power limits in Annex 1 to Resolution 76, taking into account the characteristics of the networks submitted recently and the overall trend for a growing interest in operating non-GSO FSS systems, with the view to ensure that all existing services are adequately protected.To facilitate the coordination and sharing of frequency assignments, establishment of off-axis antenna gain limitation on earth stations of non-GSO FSS, review of satellite antenna gain (e.g. beamwidth, radiation pattern…) as well as the use of steerable beams to the maximum extent possible should be considered and further studied within the ITUR study groups.The algorithm in Recommendation ITU‑R S.1503-2 has been used as the functional requirements of software tools provided to the Bureau to check non-GSO systems for conformity with the relevant Articles of the Radio Regulations, WRC-15 may also wish considering reviewing or confirming the pertinence of some assumptions related to Recommendation S.1503-2, such as, for example, the nature of the pfd/eirp masks to be submitted under item A.14 in Appendix 4. |

##### 3.2.2.4.3 Coordination between non-GSO FSS systems

The Bureau has been requested to clarify the procedure of coordination between non-GSO networks, in terms of the establishment of lists of regulatory coordination requirements and the interrelationship between involved satellite networks. In that regard the Bureau would like to refer to the Rule of Procedure on No. 9.6 of the Radio Regulations applicable to all GSO and non-GSO satellite networks, in particular to § 1 b) indicating that the intent of No. 9.6 is to identify to which administrations a request for coordination is to be addressed, and not to state an order of priorities for rights to a particular orbital position, § 1 c) the coordination process is a two way process and § 1 d) no administration obtains any particular priority as a result of being the first to start either the advance publication phase (Section I of Article 9) or the request for coordination procedure.

The list of affected non-GSO networks identified under No. 9.12 for the coordination of newly submitted non-GSO FSS is based on the frequency overlap only. Although, ITU-R Recommendations were developed providing examples of interference calculations involving non-GSO systems and describing different FSS protection criteria, no methodology to assess compatibility between non-GSO FSS has so far been agreed.

The Bureau is being increasingly solicited with requests for information on possible methodologies and approaches to conduct coordination between non-GSO FSS networks. In the absence of relevant information, the Bureau has so far recommended involved parties to agree on a bilateral basis on the methodology to be used. The nature of the non-GSO FSS systems filed so far containing very large numbers of satellites, a wide diversity of orbital characteristics (plane altitude and inclination) and global visible earth coverages may require new innovative approaches for the coordination.

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| Beyond specific parameters for the earth and space stations applying to non-GSO constellations as indicated above, administrations and operators may agree on a more dynamic coordination approach based e.g. on orbit synchronization and the usage of the systems in real-time, taking account of all non-GSO systems in operation. In such a case, beyond the traditional bilateral coordination approach systems and to ensure that the data for such dynamic coordination approach be easily available and regularly updated, a new coordination process might be considered that would include regular multilateral meetings involving the relevant parties with milestone on the development of the constellation similar to consultation meetings (as in Res. 609 (Rev.WRC-07)) or reassessment meetings (as in Res. 222 (Rev.WRC-12)). In that context, coordination agreements between non-GSO FSS systems may results in slight changes in the Appendix 4 orbital characteristics of the involved systems. The effect of such changes resulting from joint efforts of the administrations concerned to reach agreement on coordination on the date from which the coordination information of a system is to be taken into account under § 1 of Appendix 5 may deserve some consideration by WRC-15. WRC-15 may wish to study this issue further with a to view improving the orbit and spectrum efficiency for operation of non-GSO FSS satellite systems.  |

##### 3.2.2.4.4 Bringing into use of frequency assignments to non-GSO satellite systems

The bringing into use of frequency assignments to a space station of a satellite network is regulated by the provisions of No. 11.44 of the Radio Regulations. As a practice by the Bureau, for a satellite network using non-geostationary satellite orbits, a frequency assignment to such a satellite network has so far been considered as having been brought into use when a single satellite with the capability of transmitting or receiving that frequency assignment has been deployed on one of the notified orbital planes, irrespective of the number of satellites and orbital planes in the satellite network constellation. A continuous period of at least three months of operation of that satellite is considered necessary to confirm the bringing into use.

Taking into account of the numerous non-GSO systems received so far by the Bureau, and the possible speculative nature of such submissions that could lead to spectrum warehousing and resurgence of so-called “paper satellite networks”, the conference may wish to consider redefining the notion of bringing into use for non-GSO satellite networks.

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| A possible approach for the bringing into use of a non-GSO satellite network could be, for example, a phased approach with milestones based on either one satellite or a percentage of the total number of satellites deployed at the end of the seven-year time limit (No. 11.44) and the completion of the total deployment within a reasonable period after the bringing into use in either one or two steps (e.g. original date of bringing into use plus [3] years and [6] years). Failure to meet one of these milestones would, for example, result in cancellation of the frequency assignments for the milestone at the end of the seven-year time-limit (No. 11.44), and adjustment of the notified information of the non-GSO system based on the actual number of satellites and orbit characteristics in operation at the end of the [3] years and [6] years milestone. |

### 3.2.3 Article 11 of the Radio Regulations

#### 3.2.3.1 Application of RR No. 11.31.1

The Rules of Procedure on RR No. **11.31.1** in force before WRC-03 mentioned that the number of administrations commenting on the Special Sections containing a request for agreement under RR No. **9.21** was limited, and as a consequence, the Bureau recorded the assignment with a favourable finding together with the name(s) of the administration(s) still having objections, indicating that with respect to this (these) administration(s) the recording was made under the conditions of RR No. **4.4**. No. **11.31.1** was modified by WRC-03 incorporating the above-mentioned Rules of Procedure which were subsequently suppressed.

Since WRC-03, the behaviour of administrations in the application of No. **9.21** has however significantly changed, as can be seen in the table below:

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| Date of receipt of notification | 01.01.2000-31.12.2004 | 01.01.2005-31.12.2009 | 01.01.2010-31.08.2014 |
| No. **9.21** Requests (number of satellite networks) | 22 | 66 | 62 |
| Average ratio of the number of agreements obtained over the number of administrations that provided comments | 52.8% | 16.7% | 27.8% |
| Number of networks for which the required coordination has been completed.  | 10 (45%) | 7 (10%) | 3 (5%) |
| Number of networks for which no agreement has been obtained. | 1 (5%) | 34 (52%) | 15 (24%) |

The increasing number of administrations expressing their objection under No. **9.21** and the decreasing number of agreements obtained at the end of the procedure result in most of the frequency assignments subject to No. **9.21** receiving favourable findings in pursuance to No. **11.31.1** and being recorded subject to not causing harmful interference to nor claiming protection from the service(s) of the objecting administration(s) from which the agreement was sought, similar to the conditions specified under No. **4.4**. However in this case, there is no statement by the notifying administration that the frequency assignments will be operated in accordance with No. **4.4**.

In order to encourage administrations to complete to the maximum extent possible the agreement seeking procedure under No. **9.21**, an approach similar to the one under No. **11.41.2** might be considered, in which the notifying administration should indicate to the Bureau that efforts have been made to effect coordination under No. **9.21** with those objecting administrations whose agreements have not been obtained.

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| The Conference may wish to address this issue by modifying the relevant provisions. |

#### 3.2.3.2 Objection to a coordination agreement after publication of Part I-S

A notifying administration may indicate in the Article **11** notification submission of a satellite network that a coordination agreement has been obtained with an affected administration. Such information is taken into account verbatim by the Bureau for the No. **11.32** examination. Following the publication of the information in the BR-IFIC (Part-I-S/II-S/III-S), an affected administration may inform the Bureau that a coordination agreement has not been obtained, contrary to what was indicated in the publication.

On receipt of such information, the Bureau requests clarification from the notifying administration on the status of coordination with the affected administration. The Bureau notes that very few requests for clarification are being responded to. This results in the coordination status being unclear in numerous cases.

With the aim of better reflecting the coordination status of a satellite network, as well as to formulate findings based on clear coordination status, the Bureau recently introduced a systematic review process as follows:

If no clarification is received by the Bureau within 30 days of the Bureau’s communication to the notifying administration of the contestation of a coordination status, the Bureau will send a reminder allowing a further 15 days to provide final clarification on the coordination status with the affected administration. In the reminder, the Bureau will indicate that in the absence of a response or an agreement on the status of coordination, the Bureau shall consider that the notifying administration tacitly agrees that coordination agreement has not been obtained.

Taking into account the fact that affected administrations can submit information on a different coordination status at any time before or after Part II-S publications, and in order not to unduly delay the processing of notification submissions, the Bureau is examining the notification information under No. **11.32** as follows:

– If the enquiry process is completed before the Bureau’s Weekly Approval Meeting, then the coordination status based on the results of the enquiry will be taken into account in the formulation of findings;

– If the enquiry process is not yet completed before the Bureau’s Weekly Approval Meeting, the findings with respect to the affected administration will be based on the coordination status submitted by the notifying administration at the time of notification. The Bureau will then take appropriate action, whether to review or not the findings, after the conclusion of the Bureau’s enquiry process.

The Conference is invited to note the above mentioned approach.

#### 3.2.3.3 Notification of stations in the sea

##### 3.2.3.3.1 Space services

Resolution **1 (Rev.WRC-97)** of the Radio Regulations resolves “that, unless specifically stipulated otherwise by special arrangements communicated to the Union by administrations, any notification of a frequency assignment to a station shall be made by the administration of the country on whose territory the station is located”.

The Resolution does not envisage the notification of a frequency assignment to a station that would be located in the sea and not within the territory of any country.

Due to increase commercial and scientific activities in the sea, the Bureau has received a number of enquiries on the notification of frequency assignments to FSS earth stations located on structures in the sea.

The United Nations Convention on the Law of the Sea (UNCLOS) specifies that in the exclusive economic zone, which is an area beyond and adjacent to the territorial sea, the coastal State has jurisdiction with regards to the establishment and use of artificial islands, installations and structures. Moreover, the UNCLOS specifies that the coastal State has exclusive rights to authorize and regulate their construction, operation and use in the zone.

Therefore, pursuant to RR Article **18**, the Bureau assumes that the government of the coastal state would be the administration that is responsible for licensing stations (e.g. FSS earth stations) located on such artificial islands, installations and structures, as well as for notification of frequency assignments to these stations under RR Article **11**.

In view of the above, when a frequency assignment to an FSS earth station on artificial islands, installations and structures in an exclusive economic zone is notified by an administration which is internationally recognized as the coastal state of that exclusive economic zone (EEZ), the Bureau considers the notification information receivable and processes the notification in accordance with Article **11**.

There is so far no comprehensive map of exclusive economic zones internationally agreed. Also, the borders between overlapping EEZ are under discussions in many instances, which may further complicates verification of a station location vis-à-vis the EEZ of the notifying administration.

In response to the receipt by the Bureau of notification of FSS earth station located in the sea, the Bureau’s approach has been therefore to accept and process such notifications of earth stations if they are installed on fixed artificial objects in the exclusive economic zone of the notifying administration where no international dispute exists.

Beyond the consideration of stations located in the exclusive economic zone of a notifying administration, the broader issue of the status of stations in high seas, where normally any state has freedom to construct artificial installations permitted under international law, subject to Part VI of UNCLOS, also remains open.

The Conference may wish to further address this issue.

##### 3.2.3.3.2 Terrestrial services

With regard to the terrestrial services, the notification of a frequency assignment to a station situated in international waters on an oil platform is receivable by the Bureau. When notifying it to the Bureau, the administration shall indicate that the assignment is operated from a platform.

It may be also noted that around 15 600 frequency assignments to terrestrial stations located in the sea have been registered in the Master Register from 1982 to the present time.

The Conference may wish to further address this issue.

#### 3.2.3.4 MIFR and recording of satellite networks under RR No. 11.41

The Radiocommunication Bureau is tasked to perform the technical regulatory examination of satellite networks submitted by administrations to ITU for notification and recording in the Master International Frequency Registry in accordance with the Radio Regulations.

Consequently, with the main ITU-R objective of ensuring the free-interference operation, the Bureau has also performed analyses to understand the evolution and current situation of frequency assignments associated to satellite networks recorded in the MIFR, as well as reports of harmful interference to space services with the aim of providing the conference with the necessary information for further consideration.

In doing so, several aspects were noticed and are described below.

##### 3.2.3.4.1 Evolution and trend of No. 11.41 recordings

The number of entries of satellite networks in the MIFR is growing at an average rate of 4% per year with more than 55% of the total of frequency assignments recorded under No. **11.41**.

The following table shows the evolution of number of frequency assignments of GSO networks in all non-planned services recorded in the MIFR.

The evolution of the number of frequency assignments of GSO satellite networks in the fixed-satellite service (excluding **AP30B**)) in the C, Ku and Ka bands together with those recorded under No. **11.41** is shown below:



##### 3.2.3.4.2 No. 11.41 ratio vs. actual harmful interference ratio

The first objective of the ITU-R Sector, as included in the Strategic Plan for the Union for 2016-2019 (Resolution 71 (Rev. Busan, 2014), is to “Meet, in a rational, equitable, efficient, economical and timely way, the ITU membership’s requirements for radiofrequency spectrum and satellite-orbit resources, while avoiding harmful interference”. The associated outcome indicator is the percentage of spectrum assigned to satellite networks which is free from harmful interference. Based on cases reported to ITU during the last four years, the current baseline value of this indicator is 99.97%. The target for 2019 is 99.99%.

The expression “free from harmful interference” refers to the equivalent bandwidth which was not affected by harmful interference. This information is derived from the reports submitted by administrations either requesting assistance to the Bureau under RR No. **13.2** or for information purposes only.

For the purposes of this analysis, the expressions “spectrum assigned to satellite networks” or “satellite capacity” refer to the total bandwidth associated to all the GSO satellite networks recorded in the MIFR as described in the following equation:

 Total BW recorded in MIFR = 

where:

 *x* = satellite network recorded in MIFR with status 50 and 11.31 favourable finding

 *g* = group ID of specific satellite network “*x*” with status 50 and 11.31 favourable finding

 *BW*(*fmax; fmin*)*x,g =* bandwidth (*fmax*-*fmin*) associated to this group “*x*” for unique pairs of (*fmax*; *fmin*) within the network “*g*”.

The percentage of total satellite capacity recorded in the MIFR without harmful interference reported to the Bureau (99.96% in 2012) would seem to be high despite the percentage of frequency assignments recorded in the MIFR with application of No. **11.41** (55.78% in 2012). In view of the numerous missing coordination agreements, more incidents may be expected to be reported to the Bureau. One explanation for this apparent discrepancy is due to the fact that actual satellite network frequency assignments are operating with characteristics less aggressive in terms of potential for harmful interference and protection than those recorded in the MIFR. Another one is that notification is made under No. **11.41** only in respect of satellite networks for which coordination was of a lesser priority, i.e. with larger orbital separation.

Addressing the following aspects may contribute to a more realistic scenario in accordance with the above-mentioned ITU-R Objective No. R.1:

a) To update the coordination criteria and methodology, as well as permissible interference criteria, taking into account the advantages that the latest technologies (e.g. advanced coding and modulation techniques) have already been brought to the sharing scenario among GSO satellite networks.

b) To limit the notified parameters associated to the satellite networks to the actual characteristics in terms of service area, antenna gain contours, minimum and maximum values of power levels, noise temperature and *C*/*N*, for example.

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| The Conference may wish to take into account these remarks and possible improvements when discussing agenda item 7 and potential review of coordination criteria between GSO satellite networks |

#### 3.2.3.5 Review of a coordination status of frequency assignments recorded under RR No. 11.41

RR Nos. **11.41A** and **11.41B** specify the conditions for the findings of an assignment recorded under No. **11.41** to be reviewed based on changes of coordination status.

The review of findings under No. **11.41A** has not been implemented by the Bureau in the past due to the complex RR No. **11.32A** examination process. However, as the result of the optimization of examination software and overall increase of computational power, the Bureau is now in the position to fully implement No. **11.41A** for all requests of application of No. **11.32A**/**11.41** received from 1 January 2015.

The new process is keeping a record of the networks of administrations which were the basis of unfavourable finding under No. **11.32A** for a recorded assignment under No. **11.41**, and the record will be updated whenever one of these networks is suppressed.

#### 3.2.3.6 Requirement to notify the date of bringing into use of frequency assignments to inter-satellite links of space stations in the geostationary-satellite orbit communicating with space stations in the non-geostationary-satellite orbit

In RR No.**11.44B**, a frequency assignment to a space station in the geostationary-satellite orbit to be considered as having been brought into use, has to be deployed and maintained at the notified orbital position for a continuous period of ninety days with the capability of transmitting and receiving that frequency assignment. Moreover, the notifying administration of the space station shall inform the Bureau within thirty days from the end of the ninety-day period after having brought into use the frequency assignment.

Therefore, when the notification informing that a frequency assignment to a space station in the geostationary-satellite orbit has already been brought into use includes a date of bringing into use of more than 120 days before the date of receipt of that notification information, the date, 120 days before the date of receipt of the notification information, instead of the notified date submitted in the RR Appendix **4** form, is indicated in the MIFR in field A.2.a as the date of bringing into use with a note by the Bureau attached to the assignment stating:

*“satellite “AAA” (Name of the satellite, item A h) of Annex 2 to Resolution 49) has been first deployed and maintained at the nominal geographical longitude “XXX” (longitude, item A.4.a.1 of Appendix 4) on the geostationary-satellite orbit since the date “DD.MM.YYYY” (Date, Item A.2.a of Appendix 4) indicated in the original Appendix 4 submission under the frequency assignments of the relevant satellite network “BBB” (Identity of the satellite network, Item A.1.a of Appendix 4)”.*

The No. **11.44B** requirement is applicable only to a frequency assignment of a space station in the geostationary-satellite orbit and not to a frequency assignment of a space station in the non-geostationary satellite orbit. As a result, for the case of notification of a frequency assignment to an inter-satellite link of a space station in the geostationary-satellite orbit, where one end of the link is on a GSO space station and the other on a non-GSO space station, the date of bringing into use (in the MIFR field A.2.a) of the frequency assignment could be different for the GSO and non-GSO space stations if the notice for the GSO space station includes a date of bringing into use more than 120 days before the date of receipt of the notification information.

In light of the above, for frequency assignments to inter-satellite links of space stations in the geostationary-satellite orbit where one end of the link is on a GSO space station and the other on a non-GSO space station, the Bureau accepts information on the bringing into use from administration to the Bureau beyond the thirty-day deadline described in No. **11.44B**.

#### 3.2.3.7 Reservation of service areas without bringing into use or continuous use of associated frequency assignments

The Radiocommunication Bureau is receiving coordination request information for satellite networks including global/regional beams or steerable beams whereas the area over which these beams can be steered is defined, for example, as worldwide, and for which frequency assignments are brought into use or are in continuing use on a restricted part of the service area only, e.g. the territory of one or a few administrations, which may lead to service area warehousing. There is no provision under the present framework of the Radio Regulations that can prevent such usage, which is thus considered in conformity with the Radio Regulations.

In order to ensure that the provisions of RR No. **11.44** and No. **11.44B** are applied in conformity with the regulations for frequency assignments associated to the above-mentioned types of beams, consideration could be given to a regulatory provision or resolution that would require the notifying administration of the satellite network to confirm which part of the beam service area had been brought into use and continue to be in use under No. **11.44** and No. **11.44B** before the expiry of a [3]-year period after the date of bringing into use of the frequency assignments associated to the relevant beam in order for the frequency assignments to continue to be taken into account over the whole notified service area. The absence of response by the notifying administration of the satellite network would trigger a review by the Bureau of the service area over which the service is provided under No. **13.6** of the Radio Regulations.

The Bureau would then publish this information in a special section with a period of [3] months for listed administrations and other administrations included in the service area of the relevant beam to confirm the inclusion of their country in the service area or deny the inclusion of their country in the service area. In the absence of response by an administration included in the service area within the stipulated time period, the Bureau would insert a symbol in the remark column of the Master Register of the relevant beam frequency assignments to indicate the countries not having confirmed being part of the service area of the beam.

The Bureau would then propose to adjust the service area of those beams and update the entry in the MIFR accordingly. The Bureau would also request the notifying administration to suitably modify, as far as practicable, the associated beam antenna gain contours. Such proposed adjustment could be subject to a decision of the Board.

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| The Conference may wish to address this issue by modifying the relevant provisions of the RR or creating a new resolution.An example of a possible modification to the Radio Regulations is provided below:**ADD****11.44C** An administration, or one acting on behalf of a group of named administrations shall, no later than [3] years after the notified date of bringing into use of an assignment under No. **11.44** and **11.44B**, provide to the Bureau a list of countries [or geographical areas] within the service area or areas of the satellite network beam where the service is being actually provided. On receipt of the information the Bureau shall [promptly] publish this information in the BR IFIC [within three months]. An administration within the services area of the satellite network but not identified in the list or an administration objecting to its identification in the list shall, within [3] months from the date of the publication of the relevant BR IFIC, inform the initiating administration and the Bureau of its objection to remain in the service area. The Bureau shall delete the territory of the objecting administration of the service area of the satellite network and inform the responsible administration accordingly. If the Bureau receives no reply within the [3] month period, it shall insert a symbol in the Remark Column of the Master Register to indicate the name of the countries having not confirmed being part of the service area of the beam. If the notifying administration does not provide the requested information within the above [3] years or in case of disagreement by the notifying administration on the adjustment of the service area, the Bureau shall apply the provisions of No. **13.6** and bring the matter to the attention of the Radio Regulations Board.     (WRC‑15)**ADD** Footnote (**5.xxx**)The use of the bands [*insert table*] by [*insert relevant services*], as appropriate is subject to the application of No. [**11.44C**].     (WRC-15)  |

#### 3.2.3.8 Notification of typical earth stations in the fixed-satellite service (FSS)

The concept of a typical earth station in the fixed-satellite service is not defined in the Radio Regulations but is widely used and referred to in Articles **9** and **11** of the RR. From No. **11.17**, it may be understood as an administrative vehicle by which a number of earth stations with unspecified or loosely specified location characteristics may be notified to the Bureau under Article **11** in the form of one single notice instead of a number of them.

For completing frequency coordination of satellite networks, administrations often agree on transmission characteristics for frequency assignments in the band of interest including EIRP level (both up and down) and typical earth stations to be used in a specified service area. Reference to typical earth stations is also mentioned, for example, for coordination of such earth stations of an FSS non-geostationary satellite network in respect of terrestrial stations (No. **9.15**).

The sharing between fixed service (FS) and FSS in frequency bands allocated with equal rights is well established using the concept of coordination area of the FSS earth station (Appendix **7** of the RR). To ensure equality of access to spectrum in border areas by terrestrial stations such as FS stations and space services such as FSS earth stations sharing these bands, No. **11.17** explicitly limits to individual notices the notification of earth stations in such bands when the coordination area of the earth station includes the territory of another administration.

Traditionally, in frequency bands below 4 GHz, where the coordination area of an earth station may have a large size and include the territory of another administration, FSS stations were not so numerous and FS was restricted to radio-relay networks with a few stations using directional antennas. Nowadays, FSS earth stations are however widely deployed with small antenna sizes, e.g. for TVROs, DTH, VSAT which are essentially ubiquitous in nature. This evolution raises a difficulty since the protection of an earth station requires its notification through Article **11**, which cannot be done for typical earth stations.

On the other end, if the service area associated with the notification of a typical FSS earth station is given as the territory of an administration, the coordination contour of some of the corresponding earth stations in this area will necessarily contain the territory of neighbouring countries, thereby precluding their notification and recording of terrestrial stations in the MIFR.

The protection of typical FSS earth stations against interference caused by other satellite networks operating in the same direction of transmission is derived from the coordination under RR Nos. **9.7**, **9.12**, **9.12A** and **9.13**, as appropriate, but only relates to the relationship between satellite networks or systems. This protection stems from the recorded frequency assignments of the space station which include the characteristics of the associated earth stations. With respect to the notification of earth stations, Resolution **1 (Rev.WRC-97)** applies and to notify earth stations in bands shared with terrestrial services with equal rights, RR Nos. **11.17** and **11.20** requires the coordination and recording of individual stations.

In accordance with RR Nos. **11.17** and **11.22**, earth stations whose coordination area does not include the territory of another administration, could be notified in the form of the characteristics of a typical earth station and the intended geographical area of operation. In other words, all earth stations in the service area located at points where the coordination area does not include the territory of another administration would be in a position to claim international recognition. RR Appendix **7** is used to check whether or not the coordination area of an earth station includes the territory of another administration, and currently it requires individual location to determine the coordination area except for mobile earth station and typical earth station in the broadcasting satellite service. To determine the coordination contour for a typical earth station in the FSS, a modification would be required to Appendix **7** accordingly.

In this context, it may be noted that No. **8.3** of the Radio Regulations specifies that “any frequency assignment recorded in the Master Register with a favourable finding under No. 11.31 shall have the right to international recognition”. For such an assignment, this right means that other administrations shall take it into account when making their own assignments, in order to avoid harmful interference. In addition, frequency assignments in frequency bands subject to coordination or to a plan shall have a status derived from the application of the procedures relating to the coordination or associated with the plan.”

How can then an administration obtain international recognition for the operation of very small antenna applications including TVROs, DTH, VSAT?

Taking the above into account and pending requests at the Bureau from administrations to provide an international recognition to the millions of earth stations used for very small antenna type of applications (e.g. TVROs, VSAT, DTH, etc.) operated in the fixed-satellite service and more specifically in the bands 5 850-6 725 MHz and 3 400-4 200 MHz over their national territory, the Bureau sought the Radio Regulations Board’s advice at its 69th meeting (1-9 June 2015) on the possible way forward to further investigate and proceed such requests.

The Board carefully considered the information provided by BR in Document RRB15-2/5 and noted its potential importance in the work of WRC-15. The Board further noted that this aspect was already proposed to be reported to WRC-15 by the Director in its Report to the Conference (see Document RRB 15-2/INFO/2, section 3.2.3.8). As a result of these considerations, the Board requested the BR to provide additional information on the difficulties anticipated and the impact on the BR in treating such notices to the 70th meeting of the Board (19-23 October 2015) and decided to continue discussion on this item.

An example of a possible way to handle the above requests may be the following.

Any administration wishing to inform the membership about the deployment of numerous earth stations used for very small antenna type of applications (e.g. TVROs, VSAT, DTH) in the FSS within its territory and to obtain international recognition would send to the Bureau detailed technical characteristics of the involved earth and space stations (Appendix 4 information for the typical earth station including the service area (see Appendix 4, items C.10.d) and the number of stations operating or to be operated, as well as the associated space station). The Bureau would then publish this information in PART-IS, then examine the notice with respect to No. **11.31** and publish the information in PART-IIS with a clear indication that such publication is solely for the purposes of international recognition, without any status derived from the application of No. **11.32** or No. **11.32A** of the Radio Regulations. (This indication could be implemented by incorporating a new code in the Preface that would be inserted in the column 13 B2).

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| The Conference may wish to further investigate and address the above issue.  |

#### 3.2.3.9 Excessive notified characteristics of recorded frequency assignments of GSO satellite networks operating in the FSS, BSS, MSS and associated space operation functions

Some recorded frequency assignments for satellite networks recorded in the Master International Frequency Register present a wide range of technical parameters with some combinations leading to unlikely link budgets that are either over-sensitive to interference (i.e. triggering coordination at very low power levels) or creating unrealistic levels of interference, and above all far from the actual operation of the satellite network frequency assignments. Very sensitive links have also the capability of requiring excessive coordination requirements with satellite networks with a later date of submission of coordination information.

Such situations may be preventing administrations from completing coordination and limits the efficient use of spectrum/orbital resources.

In order to improve this situation, the Bureau intends in accordance with No. **13.6** of the Radio Regulations, to consult the notifying administration and request clarification and possible amendments to suitably modify the basic characteristics of an entry in the MIFR whenever the notified characteristics as specified in Appendix **4** seem incongruous.

For that purpose, the Bureau is currently defining a list of criteria to define possible excessive parameters taking into account the characteristics of the FSS, BSS and MSS systems and associated space operation links widely used and existing limits established in the Radio Regulations and ITU‑R Recommendations.

The following criteria that may trigger a request for clarification by the Bureau have been identified:

1) Unrealistic antenna patterns

– high-gain non-directional antennas; notified ND-EARTH antenna patterns with maximum antenna gain of more than 15 dB seems unrealistic;

– obsolete reference antenna patterns of Recommendations ITU-R S.465-3, S.580‑2, S.580-5 that could be replaced with the current versions of these reference antenna patterns or even with more effective antenna patterns;

– small earth stations having *d*/λ < 50 using Recommendation ITU-R. S.580-6 as the reference antenna pattern without paying attention to Note 3 of this Recommendation informing that this antenna pattern will not be used for small earth stations.

2) Satellite receiving noise temperature

– unrealistically low noise temperature in the satellite beam below 300 K in C‑Band, 400 K in Ku-Band, 700 K in Ka-band.

3) E.i.r.p. of the earth stations

– off-axis e.i.r.p. density levels significantly exceeding those of Recommendation ITU‑R S.524 which are significantly exceeded even considering uplink power control;

– maximum e.i.r.p. exceeding reasonable values (e.g. > 30 dBW/4 kHz).

4) E.i.r.p. of the space stations

– maximum e.i.r.p. exceeding reasonable values (e.g. > 30 dBW/4 kHz).

5) Misalignment of the service areas contours with transmitting/receiving gain contours.

– cases where the service area is confined to a very small region but gain contours extend to global visible Earth region;

– 0 dB boresight located outside the service area.

Based on the above criteria, the Bureau plans by beginning 2016 to analyse the notified data for each satellite network recorded in the MIFR and contact the notifying administration for clarification as the need may be.

### 3.2.4 Other articles of the Radio Regulations

#### 3.2.4.1 Station keeping of space stations

For operational purposes such as, for example, risk of collision, TT&C operation, coordination agreement, etc., a satellite may have to shift a little from its nominal orbital position (including the ±0.1 degree tolerance for space stations on board geostationary satellites in the fixed-satellite service or broadcasting-satellite service) to provide the required services. In that particular instance, when requesting clarification under Nos. **11.44**, **11.44B** or **13.6** of the Radio Regulations on the bringing into use or continuing use of the notified characteristics of a satellite network, the Bureau considers that a satellite located at no more than 0.5 degree of the longitude of the nominal position of the satellite network would be considered as fulfilling Nos. **11.44**, **11.44B** or **13.6** requirements, as appropriate, under the conditions that the space station is associated to one or more satellite network filings at one single orbital position, that the space station has the capability to maintain its position within the ±0.1 degree of its nominal positions, that no unacceptable interference be reported when the satellite’s excursion is exceeding this tolerance (up to maximum 0.5 degree), and that this operation does not cause more interference or require more protection than if the space station was operating within the ±0.1 degree tolerance.

In that regard, the Bureau was asked whether a satellite located at less than 0.5 degree of the nominal positions of two different satellite networks could be considered for the bringing into use or continuing use of the notified characteristics of both satellite networks under Nos. **11.44**, **11.44B** or **13.6**. Indeed consideration could be given to the sharing of a satellite platform with different payloads, each payload related to one single satellite network, e.g. a platform located at less than 0.5 degree of a satellite network X and a satellite network Y with the use of a payload on the satellite in band A associated to satellite network X and a payload in band B associated to satellite network Y, taking account that the satellite platform has the capability to maintain its position within the ±0.1 degree of the nominal positions of both satellite networks, that no unacceptable interference be reported and that this operation would not cause more interference or require more protection than if each space station was operating within the ±0.1 degree tolerance of each of the involved satellite network.

At this stage the Bureau indicated that such approach was considered beyond the scope of its responsibility and in contradiction with the practice agreed so far by the Radio Regulations Board.

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| The Conference may wish to further investigate and address the above issue.  |

#### 3.2.4.2 Processing of requests under No.23.13B of the Radio Regulations to a network submitted under Appendix 30

According to No.**23.13B** of the Radio Regulations, if an administration, within the four-month period following the publication of a special section for a broadcasting-satellite service network submitted under Appendix 30, informs the Bureau that all technical means have not been used to reduce the radiation over its territory, the Bureau shall draw the attention of the responsible administration to the comment received.

Although there is no time-limit for the Bureau to take action, in practice, the Bureau has so far sent a telefax immediately to the objecting and the responsible administrations when the comment is received, requesting both administrations to make every effort possible to resolve the issue. Due to the ever-increasing number of comments received under No. **23.13B**, the current approach is affecting the workload for the Bureau.

In order to perform this task in a more efficient manner and optimize the resources of the Bureau, it is proposed to send a multi-countries communication to, on one hand, all those administrations who have made comments under No. **23.13B**, and on the other hand, the responsible administration for the satellite network in the broadcasting-satellite service at the expiry date of the four-month regulatory period for comments on the BSS satellite network.

#### The Conference is kindly requested to endorse the method proposed above.

#### 3.2.4.3 Frequency assignments used in space services with a direct or indirect reference to the provisions of Article 48 of the Constitution

Under the provisions of RR No. **13.6**, the Bureau requests the notifying administrations to review the use of their recorded satellite networks and to remove unused frequency assignments and networks from the MIFR. Accordingly, whenever it appears from reliable information available that a recorded assignment has not been brought into use or is no longer in use, the Bureau consults the notifying administration and requests clarification. In response, some administrations claim that the information on the actual operation of their satellites may not be released and that official or reliable information could not be found from external public sources with eventually a reference the provisions of Article 48 of the Constitution. The Bureau has so far not questioned such declaration by the notifying administration and thus has exempted these assignments from further verification.

According to the statistics available in the Bureau’s records, as of June 2015, there are 15 administrations claiming use of frequency assignments for national defence services, for a total of 120 satellite networks in 62 unique orbital positions for assignments in the broadcasting-satellite service, fixed-satellite service, space operation, mobile-satellite service, space research, meteorological-satellite service, inter-satellite service and radionavigation-satellite service and for the following nature of service: station open to official correspondence exclusively, station open to public correspondence, station open to limited public correspondence, station open exclusively to correspondence of a private agency and station open exclusively to operational traffic of the service concerned (see Annex 1).

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| In view of the wide variety of services and the nature of service involved, the conference might wish to consider assessing the relevance of the services and associated natures of services to which a direct or indirect reference to the provisions of Article 48 of the Constitution may be related and the further processing of such information under the relevant provisions of the Radio Regulations. |

#### 3.2.4.4 Comments related to Article 43

In deliberations related to WRC-15 agenda item 1.17 on Wireless Avionics Intra-Communications (WAIC), an inconsistency was detected between the definition of the aeronautical mobile service as contained in RR No. **1.32** and the provisions of No. **43.1** of the RR.

No. **1.32** defines the aeronautical mobile service as a mobile service between aeronautical stations and aircraft stations, or between aircraft stations, while No. **43.1** limits the aeronautical mobile (R) service to communications between aircraft and aeronautical stations, without mentioning communications between aircraft stations.

The Conference may wish to consider reviewing this discrepancy by modifying No. **43.1** accordingly.

Furthermore, if WRC-15 makes allocations to the AM(R)S reserved for WAIC systems, then both Nos. **1.32** and **43.1** may need to be amended to reflect that the aeronautical mobile service also comprises communications between two or more points within a single aircraft, pursuant to the definition of WAIC in Resolution **423 (WRC-12)**.

### 3.2.5 Comments relating to Appendices 4 and 8 of the Radio Regulations

#### 3.2.5.1 Data items related to terrestrial services

In the reporting period, the Bureau received a number of requests for clarification concerning the notification of specific parameters of stations in the terrestrial services. The related discussions with administrations indicated possible amendments to Annex 1 of RR Appendix **4**, as summarized below.

WRC-15 may wish to consider them and decide on the appropriate revision of Appendix **4**.

##### 3.2.5.1.1 Introduction of new data items for digital radio and television broadcasting stations

Taking into consideration the emerging digital broadcasting transmission systems, it is necessary to specify the fields “offset”/1EO, “class of emission”/7A and “Necessary bandwidth”/7AB as mandatory for VHF/UHF digital broadcasting assignments outside the GE06 Agreement in order to identify the transmission system.

##### 3.2.5.1.2 New data items for HAPS gateway links

WRC-12 allowed the use of the bands 6 440-6 520 MHz and 6 560-6 640 MHz for gateway links of high-altitude platform stations (HAPS) in some countries pursuant to RR No. **5.457**. The associated Resolution **150 (WRC-12)** made the notification of HAPS gateway links mandatory and invited administrations and the Bureau to determine the data elements of HAPS gateway stations necessary for such notification. After necessary consultations, the Bureau established the list of the data items to be notified and communicated it to administrations by Circular Letter CR/345 of 8 May 2013. WRC-15 may wish to decide on possible inclusion of the data items listed in this Circular Letter into RR Appendix **4**.

#### 3.2.5.2 Data items related to space services

##### 3.2.5.2.1 Steerable beam antenna gain contours covering areas beyond the submitted service area

WRC-12 added a note to item B.3.b.1 of Annex 2 to RR Appendix **4** in order to encourage administrations to align the area that satellite steerable beams cover with the service area of their networks with due regard to their service objectives. It is understood that, when necessary, the Bureau could send a telefax to the notifying administration confirming or providing a commitment that its submission meets the requirements of RR No. **15.5**, thereby minimizing unnecessary radiation to and/or from areas outside the service area.

The Bureau has so far received few adjustments to the coverage area of a steerable beam under the above-mentioned note to item B.3.b.1. In some cases, the administration insisted on no adjustments to the coverage area. However, the Bureau continues to receive coordination information for satellite networks with steerable beams that have the service area restricted to the territory of one or a few administrations with worldwide coverage areas.

The Bureau has also observed that in certain cases, in reply to the Bureau’s inquiries, administrations requested to change steerable beams to fixed beams in order to maintain the submitted antenna gain contours.

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| The Conference may wish to further address this issue in order to ensure that the requirements of No. **15.5** are met. |

##### 3.2.5.2.2 Treatment of frequency assignments with a bandwidth less than the stated averaging bandwidth

Footnote 2 to Tables A, B, C and D of Annex 2 to RR Appendix **4** as modified by WRC‑12 suggests the use of the most recent version of Recommendation ITU‑R SF.675 to calculate the maximum power spectral density. In particular, for the identification of the maximum power spectral density of different type of carriers, it recommends considering the maximum possible number of carriers occupying a given averaging bandwidth.

Therefore, it is important for administrations to follow Recommendation ITU-R SF.675 to derive maximum spectral power density.

With regard to this requirement, the Bureau has observed that, for a large number of emissions (50‑60%) contained in the SRS database having a necessary bandwidth less than the averaging bandwidth, the maximum power density is based on a single carrier occupying the averaging bandwidth. This is contrary to real systems where multiple carrier operation could be envisaged, particularly taking into account that the frequency assignment group bandwidth far exceeds the necessary bandwidth of an emission for those above-mentioned cases.

As a consequence, the Bureau has encountered the following difficulties.

a) Article 21 PFD examination

In the current PFD examinations for cases when the carrier necessary bandwidth is less than the reference bandwidth, a single carrier maximum total peak power is used for the PFD calculation. Maximum power spectral density is not used in this case due to uncertainty as to which method administrations are using to derive the maximum power spectral density.

However, provided that the Recommendation ITU‑R SF.675 method is used by administrations to derive power spectral density values submitted in the filing, the Bureau believes that it would be appropriate to use in the PFD calculation the maximum power spectral density multiplied by the reference bandwidth for all cases (carrier necessary bandwidth greater, equal or less than the reference bandwidth).

The Bureau is seeking confirmation whether this change to the PFD calculation method could be considered acceptable.

b) *C*/*I* method in RR No. 11.32A examination

In calculating *C*/*I*, the maximum total peak power of a carrier signal is used. If the wanted carrier bandwidth is larger than interfering carrier bandwidth, adjustment is made to resulting *C*/*I* which takes into account increase of interference due to multiple interfering carriers falling into wanted carrier bandwidth. For narrow-band carriers such as TT&C where no multi-carrier operation is envisaged this multiplication of maximum total peak power could lead to the overestimation of interference.

In order not to overestimate potential number of interfering carriers within frequency assignments group, the maximum total peak envelope power for contiguous satellite bandwidth (C.8.d.1) is used to limit the number of carriers such as:

$$Number of carriers\*Carrier max. total peak power\leq P\_{C.8.d.1} $$

However, this mechanism could not be implemented currently for the uplink calculation since similar AP4 data element limiting aggregate total peak power for the earth stations transmission (C.8.g.1) is not of mandatory nature, and administrations do not submit this data. Therefore, it may be possible to overestimate potential interference, especially for the case related to the incoming TT&C assignment.

To overcome this situation it is proposed:

– Given an overlap bandwidth ($B\_{Overlap}) $of wanted carrier with interfering carrier(s), use maximum power spectral density of interfering signal multiplied by overlapping bandwidth. For the overlap bandwidth larger than averaging bandwidth, however, this could also lead to overestimation since method of Rec. SF. 675 applies only to averaging bandwidth.

– Modify Appendix **4** data elements C.8.g.1, C.8.g.2 and C.8.g.3 to make them mandatory.

– In cases when wanted carrier bandwidth exceeds interfering carrier bandwidth, limiting total peak envelope power for contiguous satellite bandwidth (C.8.d.1) or aggregate total peak power for the earth stations transmission (C.8.g.1) should be adjusted taking into account that overlap bandwidth could be smaller than interfering group bandwidth ($B\_{Group}$) and, therefore, number of interfering carriers should be decreased accordingly:

$P\_{Общая.adj}=P\_{C.8.d.1 или C.8.g.1}+10log⁡\left(\frac{B\_{Overlap}}{B\_{Group}}\right)$.

c) RR Appendix 30, Article 7.1 examination

In order to determine whether an assignment in a non-planned service triggers coordination with a BSS assignment subject to a Plan, a trigger PFD-limit in a reference bandwidth of 27 MHz is used.

The Bureau considers a non-planned assignment as a single carrier within the 27 MHz reference bandwidth of the planned assignment. The interference could be underestimated especially in the case of actual multiple narrow non-planned carriers operating within the 27 MHz reference bandwidth.

It is proposed to use the maximum power spectral density of an interfering carrier multiplied by the assigned frequency bandwidth overlapped with interfered assignment but not exceeding 27 MHz. When this calculation bandwidth exceeds the interfering carrier bandwidth, it is necessary to limit the resulting interfering power to the maximum total peak envelope power within the contiguous satellite bandwidth adjusted accordingly to the calculation bandwidth.

Summary

All administrations should use the most recent version of Recommendation ITU‑R SF.675 in the calculation of maximum power density per Hz, such as the averaged power density over the reference bandwidth in order that suggested changes could resolve the difficulties encountered.

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| Consequently, the Bureau wishes to draw administrations’ attention to this issue. The Conference may wish to review this matter and introduce any reinforcement or changes in this regard. |

##### 3.2.5.2.3 Absolute satellite antenna gain value below −10 dB

In verifying the technical characteristics of a submitted satellite network, the Bureau has observed that some administrations have submitted coverage areas including antenna gain contours with very low relative gain values, resulting in a minimum absolute antenna gain value less than −10 dBi. As antenna gain values are not normally less than −10 dBi, the Bureau requested notifying administrations to delete certain submitted antenna gain contours so that the minimum absolute antenna gain value is not less than −10 dBi.

In reply to the Bureau’s inquiries, some administrations have accepted the Bureau’s proposed course of action. However, some administrations have insisted on keeping the submitted antenna contours, thus artificially reducing the coordination requirement.

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| The Conference may wish to revise Appendix **4** data item B.3.b in order to avoid the submission of unrealistic antenna gain contours. |

##### 3.2.5.2.4 Maximum number of test points under item C.11.a. of Appendix 4

In accordance with item C.11.a of Annex 2 to Appendix **4**, the service area of a network in Appendices **30**, **30A** and **30B** shall have a set of a maximum of twenty test points. Considering the service area of an assignment in the original Appendices **30** and **30A** Plans or an allotment in the Appendix **30B** Plan is limited to the national territory, 20 test points are generally considered sufficient to protect the national territory. However, as administrations are submitting additional use networks or additional systems with multinational service areas, there is a need to submit more than 20 test points in order to obtain sufficient protection throughout the service area. Notices have thus been submitted with multiple overlapping beams in the same frequency band and/or multiple similar service areas in each beam. This increases the complexity of the structure of those networks and repetition of almost identical data in the databases and causes long processing times in the Bureau’s examinations.

In view of the ongoing practice of administrations to increase the number of test points in a service area, the current limit may be too restrictive.

The Conference may wish to consider increasing the maximum number of test points beyond 20 to perhaps 100 or 200 in item C.11.a.

The number of test points for assignments in the Appendices **30** and **30A** Regions 1 and 3 Plan, the Region 2 Plan as established by the 1983 Conference and allotments in the Appendix **30B** Plan would naturally remain unchanged. When an assignment converted from an allotment is reinstated in the Appendix **30B** Plan, the notifying administration may choose not more than 20 test points within its national territory for the reinstated allotment.

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| The Conference may wish to consider keeping the maximum number of test points to 20 for reinstated allotments. |

##### 3.2.5.2.5 Submission of power characteristics for Appendix 30B notifications

In accordance with Appendix **4**, the necessary bandwidth and the class of emission shall be submitted for each carrier in a notification under Article 8 of Appendix **30B** under data item C.7.a. As a consequence, the maximum power density value for each carrier type, i.e. data item C.8.a.2, should be allowed to be submitted in a notification under Article 8 of Appendix **30B**. However, in the current Appendix **4**, the power density values can only be provided under data item C.8.b.2 for Appendix **30B** submissions.

In view of the above, the Bureau proposes the following:

a) modify item C.8.a.2 of Appendix **4** so that it is applicable for a notification under Article 8 of Appendix **30B**; and

b) modify item C.8.b.2 of Appendix **4** so that it is applicable for a submission under Article 6 of Appendix **30B**

as shown in the Table below.

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| C.8.a.2 | the maximum power density, in dB(W/Hz), supplied to the input of the antenna for each carrier type2In the case of Appendix **30B**, required only for notification under Article 8Required if neither C.8.b.2 nor C.8.b.3.b is provided |  | **+** | C.8.a.2 |  |

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| C.8.b.2 | the maximum power density, in dB(W/Hz), supplied to the input of the antenna2For coordination or notification of an Appendix **30A** earth station the values shall include the maximum range of power controlIn the case of Appendix **30B**, required only for submission under Article 6Required if neither C.8.a.2 nor C.8.b.3.b is provided |  | **X+** | C.8.b.2 |  |

##### 3.2.5.2.6 Service area below 3 degree elevation angle

RR No. **21.14** states that “*Earth station antennas shall not be employed for transmission at elevation angles of less than 3º measured from the horizontal plane to the direction of maximum radiation, except when agreed to by administrations concerned and those whose services may be affected. In case of reception by an earth station, the above value shall be used for coordination purposes if the operating angle of elevation is less than that value*”.

When identifying worst-test point, GIBC/AP8/PXT software rejects all grid-points with elevation angle below 3° measured from the horizontal plane to the direction of a space station. This criteria limits the number of generated grid-points and improves the calculation time. For space stations operating with associated specific earth stations, the test-point is predefined, and GIBC does not check whether it is located below 3° elevation angle.

Since there is no limitation to submit service area below 3° elevation angle for space stations, the Bureau receives occasionally comments from administrations under RR No. **9.41** requesting inclusion of their networks located at orbital separation of more than 160°. In order for these space stations to be identified as affected, the worst test-point should be placed at elevation angle of less than 3°.

In view of the above, the Bureau would like to report this situation and seek the decision of the Conference whether existing practice of limiting grid-points to 3° elevation should be maintained when identifying affected administrations and networks under Nos. **9.36** and **9.36.2** and, possibly, extended to No. **9.41** requests from administration, or to remove this limitation from GIBC/AP8/PXT software.

If the decision is to remove the limitation, this would require:

a) Modification of GIBC AP8/PXT modules including increase of the number of generated test-points. These modifications would increase the calculation time up to 30%.

b) For satellite networks identified by using only grid-points or points with the coordinates of specific earth stations located below the 3° elevation angle, additional consideration could be given as to how Section IV of Article 21 should be observed by administrations during the coordination.

 One of the solutions may be to highlight or mark these coordination requirements in CR/C publications in order to bring them to the attention of concerned administrations.

##### 3.2.5.2.7 Appendix 4 information for the Advance Publication of Information on non-geostationary satellite network or system

a) Orbital parameters

Many developers of small satellites, in particular nanosatellites and picosatellites that are launched as secondary payloads hesitate to initiate the Advance Publication Information (API) procedure under Sub-Section IA of RR Article **9** in the absence of the exact orbital parameters at the time of the satellite network or system submission. Furthermore, many nanosatellites and picosatellites have no propulsion devices and therefore are unable to maintain a constant orbital altitude.

For such cases, the Bureau would advise administrations to submit the best estimated value for apogee (AP4 item A.4.b.4.d), perigee (AP4 item A.4.b.4.e) and inclination (AP4 item A.4.b.4.a) for the submission of the API, noting that such information might be then updated at the stage of notification and recording of frequency assignments under Article **11** of the Radio Regulations.

To take account for the natural decay of systems that lack propulsion, it would be appropriate to submit also the minimum orbit altitude of the space station above the surface of the Earth at which the satellite transmits (AP4 item A.4.b.4.f) lower than the value submitted as perigee that would provide an indication on the inability of a satellite to maintain a constant orbital altitude. In addition a comment would be added in the API special section explaining that the minimum orbit altitude is lower than the perigee because of the lack of propulsion.

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| The Conference may wish to address the above issue. |

b) Submission of modifications to API not subject to coordination (Article 9, Sub-Section IA)

In accordance with No. 9.2, concerning the amendment of the information submitted for the API under No. 9.1, the use of an additional frequency band or, where coordination is not required by Section II of Article 9, the modification of the reference body or the modification of the direction of transmission for a space station using a non-geostationary-satellite orbit will require the application of the advance publication procedure. There is no requirement for the application of API procedure for other modifications to the network.

No. 11.28.1 was added during WRC-12 so that an administration believing that unacceptable interference may be caused to its existing or planned satellite networks or systems due to submitted modifications at the notification stage to the characteristics initially published under No. 9.2B, may provide its comments to the notifying administration.

Despite the possibility provided by the provisions of No. 11.28.1 (modification at the notification stage), the Bureau has been receiving requests for modifications to APIs involving parameters not mentioned in No. 9.2, including the extension of service areas, addition of associated earth stations, etc. Noting that such modifications, when published, provide the opportunity for other administrations to submit comments for publication in an API/B special section and facilitate the process for administrations to mutually resolve any difficulties before the notification for recording of the assignments, the Bureau encourages this practice and has continued to publish these modifications to APIs accordingly.

c) Cessation of emissions and earth station requirements

Space stations are required under No. 22.1 to be equipped with devices to ensure immediate cessation of their radio emissions by telecommand. For space stations in the amateur-satellite service, there is an additional requirement in No. 25.11 for administrations authorizing these space stations to ensure that sufficient earth command stations are established before launch to ensure that the emissions can be terminated immediately. However, the Bureau notes that in many API for satellite networks operating in the amateur-satellite service, only one specific associated earth station is included. The Bureau is therefore unable to verify if the administration has fulfilled the mandatory requirements under Nos. 22.1 and 25.11.

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| The Conference may wish to address this issue. |

##### 3.2.5.2.8 Appendix 8 (Use of information furnished under Appendix 4)

§ 2.4 of Appendix 8 on the “Use of information furnished under Appendix 4” indicates that “When an administration elects to use information furnished under Appendix 4 with the calculation procedures of § 2.2.1.1 and § 2.2.2.1 in order to formulate comments to the advance publication of a new network, the calculations need to be made for both sets of values of γ and T furnished. The greater of the two values of ΔT/T resulting from these calculations is the one to be used.”

§ 2.2.1.1 and § 2.2.2.1 are providing explanation on the calculation method for the ΔT/T between geostationary-satellite networks sharing the same frequency bands referring to Appendix 4 information that are no more submitted under Sub-Section IB of Article 9 of the Radio Regulations.

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| In view of the above the Bureau would propose a modification to § 2.4 of Appendix 8 for consideration by the Conference:**MOD Appendix § 2.4**2.4 When an administration elects to use information furnished under Appendix 4 with the calculation procedures of § 2.2.1.1 and § 2.2.2.1 in order to formulate comments, the calculations need to be made for both sets of values of γ and T furnished. The greater of the two values of ΔT/T resulting from these calculations is the one to be used. |

### 3.2.6 Comments relating to RR Appendices 30 and 30A

#### 3.2.6.1 Regulatory period for bringing assignment into use under Article 2A

It is not clear in the Radio Regulations if the regulatory period for assignments submitted under Article **2A** of Appendices **30** and **30A** should be determined at the time of submission or at the time of notification/cancellation of these assignments.

According to § 2A.2.2 of Article 2A of Appendices **30** and **30A**, the regulatory deadline for notifying and bringing into use of assignments intended to provide space operation functions, for the case where the associated BSS assignments have been submitted under § 4.1.3 or § 4.2.6 of Article 4 of Appendices **30** and **30A** for entry in the Regions 1 and 3 or a modification to the Region 2 Plan, shall be the regulatory time-limit referred to in § 4.1.3 or § 4.2.6 of Article 4 for those associated BSS assignments, provided that those associated BSS assignments have not yet been brought into use.

However, according to § 2A.2.3 of Article 2A of Appendices **30** and **30A**, when the associated BSS assignments have already been brought into use in accordance with the Radio Regulations, the regulatory deadline for notifying and bringing into use of assignments intended to provide space operation functions shall be the time-limit referred to in § 4.1.3 and § 4.2.6 of Article **4** from the date of receipt by the Bureau of the complete Appendix **4** data for those assignments intended to provide the space operation functions.

The situation may change significantly depending on if the regulatory period is determined at the time of submission or at the time of notification/cancellation of an Article 2A assignment. The Bureau has been establishing the regulatory time-limit at the time of receipt of the Article 2A submission.

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| The Bureau requests the Conference to confirm or otherwise this practice.If confirmed then it is proposed to add a footnote to § 2A.2 of Article 2A of Appendices **30** and **30A** as follows:MOD“2A.2 Any assignment intended to provide these functions in support of a geostationary-satellite network in the BSS shall be notified under Article **11** and brought into use within the following time-limitsn:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_n The time-limit is established at the time when the request is received under § 2A.1.4.” |

#### 3.2.6.2 Calculation of power control value for assignments in the List

Power control may be used to overcome rain fading in the feeder-link. § 3.11 of Annex 3 to Appendix **30A** contains the procedures for determination of the increase in e.i.r.p. during rain attenuation for an assignment. This section and the associated Rules of Procedure on power control mention that the use of power control applies only for an assignment in the Regions 1 and 3 feeder-link Plan without reference to its application to an assignment in the Regions 1 and 3 feeder-link List.

Nevertheless, Appendix **4** allows an administration to submit a power control value for its assignments in the List under data item C.8.i. The Bureau has thus accepted all submissions with a request to use power control (i.e. a power control value was submitted under Appendix **4** data item C.8.i). At the Part B stage, the Bureau calculates the power control values using the method prescribed under § 3.11 of Annex 3 to Appendix **30A** (i.e. that for Plan assignments), informs the responsible administration of the results and publishes the final power control values in the corresponding Part B Special Section.

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| In view of the above, WRC-15 is kindly invited to clarify whether an assignment in the Regions 1 and 3 feeder-link List can use power control in accordance with § 3.11 of Annex 3 to Appendix **30A**. Should that be the case, the above mention section should be modified accordingly. |

#### 3.2.6.3 Modification to an assignment in the List

An administration submitted a question to the Bureau to see if it was possible to modify an assignment after it had successfully entered into the Appendices **30** and **30A** Regions 1 and 3 List of additional uses. The reason was to ease the agreement seeking process of a satellite network under coordination.

Article 4 of the above-mentioned Appendices has no specific provisions to modify the characteristics of an assignment after it has successfully entered into the Region 1 and 3 List of additional uses except for § 4.1.23 where an assignment may be deleted from the List. If the assignment in the List is no longer suitable, the notifying administration has only the option to submit a new proposal under § 4.1.3 of Article 4 in order to replace the assignment in the List.

It is possible to modify the characteristics of an Article 4 submission at the coordination stage due to the agreement seeking process before entering into the List under § 4.1.11 but not afterwards.

The regulations assume that once coordination of the initial proposal is complete, the final characteristics are submitted under § 4.1.12, the relevant assignments are entered into the List, notified under Article **5**, and then brought into use for a period of 15 years. The concept of modifying the characteristics in order to reduce the interference produced by an assignment in the List (such as reducing power or reducing service area) was never considered under Article 4. This aspect is covered under § 5.2.1 *d)* of Article 5 of Appendices **30** and **30A**.

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| In view of the above, WRC-15 may wish to consider the issue with a view of modifying the provisions of Article 4 of Appendices **30** and **30A** to permit the modification of an assignment after it has successfully entered into the Regions 1 and 3 List of additional uses in cases where the interference into other networks is reduced. |

#### 3.2.6.4 Agreement provided under paragraph 4.1.11 of Appendices 30 and 30A

In examining Part B submissions received under § 4.1.12 of Appendices **30** and **30A**, the Bureau identifies a list of administrations whose assignments are considered as being affected and receiving more interference as a result of the modification than that produced by the initial proposal in accordance with § 4.1.11. The Bureau then requests the notifying administration to modify the submitted characteristics in order to eliminate the above-mentioned identification or to apply again the provisions of § 4.1 of Appendices **30** and **30A**.

In reply to the Bureau’s request, some administrations have provided the Bureau with the agreement of the administration identified under § 4.1.11.

As the agreement to accept more interference has been provided and § 4.1.11 does not explicitly prevent this possibility, the Bureau has not rejected such agreements.

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| In view of the above, WRC-15 may wish to modify § 4.1.11 to explicitly allow such agreements.An example of possible modification to the text of § 4.1.11 is provided below:“… are considered as being affected and receive more interference as a result of the modifications than that produced by the initial proposal and no agreement has been provided.     (WRC‑15)” |

#### 3.2.6.5 Application of § 4.1.11 of Appendices 30 and 30A in respect of space operation functions submitted under Article 2A

In accordance with § 4.1.11 of Article 4 of Appendices **30** and **30A**, the Bureau identifies a list of assignments that are considered as being affected and receive more interference as a result of the modifications than that produced by the initial proposal. The list of assignments to be taken into account is as follows:

– the assignments of any other administration received by the Bureau in accordance with § 4.1.3 or § 4.2.6, or § 7.1 of Article7, or No. **9.7** before this modified proposal is received under § 4.1.12;

– the assignments of any other administration contained in the Plans or the Lists; or

– the terrestrial services of any other administration.

However, the space operation functions submitted under Article 2A of Appendices **30** and **30A** are not included in the above-mentioned assignments.

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| As the coordination of assignments to be included in the Regions 1 and 3 List with assignments intended to provide space operation functions is required under § 2A.1.3 of Article 2A of Appendices **30** and **30A**, WRC-15 is kindly invited to consider the inclusion of space operation functions submitted under Article 2A in the list of assignments of other administration specified in §4.1.11.An example of a possible modification to the text of § 4.1.11 is provided below:MOD 4.1.11“– “the assignments of any other administration received by the Bureau in accordance with § 4.1.3 or § 4.2.6, or § 2A.1.4 of Article 2A, or § 7.1 of Article 7, or No. **9.7** before this modified proposal is received under § 4.1.12;”. |

#### 3.2.6.6 Gain towards the geostationary-satellite orbit (GSO) diagrams for a notice for a satellite network in the band 12.5-12.7 GHz in the broadcasting-satellite service under Appendix 30

Appendix **4** data item B.3.e requires the gain of the antenna in the direction of those parts of the GSO which are not obstructed by the Earth to be provided if the space station is operating in a band allocated in the Earth-to-space direction and in the space-to-Earth direction.

The band 12.5-12.7 GHz is allocated to the fixed-satellite service in both Earth-to-space and space-to-Earth directions and is to the broadcasting-satellite service in Region 2 under Appendix **30**. However, the current Appendix **4** does not require notifying administrations to submit gain towards the GSO diagrams in this band for a notice for a satellite network in the broadcasting-satellite service under Appendix **30**.

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| In view of the above, WRC-15 is kindly invited to consider the inclusion of a requirement to submit the subject diagram under the Appendix **4** data item B.3.e for such notices.The required modification is to add a + symbol to the column “Notice for a satellite network in the broadcasting-satellite service under Appendix **30** (Articles 4 and 5)” of data item B.3.e. |

#### 3.2.6.7 Maximum power density per Hz averaged over necessary bandwidth for a notice for a satellite network (feeder-link) under Appendix 30A in 14 GHz (Appendix 4 data item C.8.h)

In accordance with Appendix **4** data item C.8.h, the maximum power density per Hz supplied to the input of the antenna, in dB(W/Hz), averaged over the necessary bandwidth is required only in the band 17.3-18.1 GHz in case of Appendix **30A**.

However, this value is required for identifying coordination requirement of a frequency assignment to be included in the Regions 1 and 3 feeder-link List with BSS feeder-link frequency assignments in the FSS (Earth-to-space) in Region 2 in the band 14.5-14.8 GHz as indicated in § 6 of Annex 1 to Appendix **30A** and the associated Rules of Procedure on footnote **5.510**.

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| In view of the above, WRC-15 is kindly invited to consider the inclusion of a requirement to submit the information under Appendix **4** data item C.8.h for Appendix **30A** notices also in the band 14.5‑14.8 GHz.An example of a possible modification to data item C.8.h is shown below:“In the case of Appendix **30A**, required only in the bands 14.5-14.8 and 17.3-18.1 GHz”. |

#### 3.2.6.8 Use of linear polarization for Article 4 networks in Region 2

In calculating the down-link C/I ratio at a test point and the *C*/*I* ratio at a space station receiver input for Region 2 BSS and associated BSS feeder-link network assignments, among other radio propagation factors, rain attenuation and rain-induced depolarization are taken into account in both wanted and interfering links as specified in § 2.2.4 of Annex 5 to Appendix **30** and § 2.5 of Annex 3 to Appendix **30A** as indicated in the table below.

|  |  |  |
| --- | --- | --- |
|  | Wanted signal path | Interfering signal path |
|  | Down-link | Feeder-link | Down-link | Feeder-link |
| Rain attenuation | Yes | Yes | Yes | No |
| Rain-induced depolarization | Yes | Yes | Yes | No |

With regard to rain attenuation, § 2.2.2 of Annex 5 to Appendix **30** and § 2.2 of Annex 3 to Appendix **30A** provides procedures and equations for its calculation. Similarly, § 2.3 of Annex 5 to Appendix **30** and § 2.4 of Annex 3 to Appendix **30A** contain procedures and equations for calculation of rain-induced depolarization. These sections indicate that the procedures and equations are for circularly polarized signals. However, the MSPACE software application calculates the rain attenuation and rain-induced polarization in the same way for both linear and circular polarized assignments.

The Bureau has recently witnessed an increasing number of Article 4 submissions in Region 2 that propose to use linear polarized assignments in addition to circular polarized assignments. As there are no provisions preventing administrations from submitting Article 4 submissions with linear polarized assignments, the Bureau accepts these submissions.

As the rain attenuation and rain-induced depolarization depend not only on climatic factors but also on the types of polarization in accordance with Recommendation ITU-R P.618-5 and other relevant Recommendations, the Bureau brought this issue to the attention of WP 4A at its meeting in July 2014 for its consideration.

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| The Conference may wish to address further the issue of calculating the rain attenuation and rain-induced polarization for the linear polarized assignments. |

#### 3.2.6.9 Improvement to the “worst-case approach”

The “worst-case approach” is applied by the Bureau to assess interference from analogue FM-TV assignments as indicated in footnote 38 to Section 3.1 of Annex 5 to Appendix **30** and footnote 37 to Section 1.7 of Annex 3 to Appendix **30A**.

In applying this method, the Bureau has noted limitations on the bandwidth of a wanted assignment as shown in the examples below.

Example 1: FM\_TV assignment to narrow-band digital assignment

 Bi = 27 MHz (Bandwidth of interfering analogue FM-TV assignment)

 Bw = 5 MHz (Bandwidth of wanted digital assignment)

 Ovl = 7.7 MHz (Overlapping bandwidth limit corresponding to the plateau in the protection mask)

 Ov = 1 MHz (Overlapping bandwidth between the wanted and interfering assignments)

 RelPR = 446.913 dB (Relative protection ratio).

As RelPR cannot be greater than 0 dB, the worst-case approach does not work correctly in this case.

Example 2: FM\_TV assignment to wideband digital assignment

 Bi = 27 MHz

 Bw = 100 MHz

 Ovl = 30.57 MHz

 Ov = 27 MHz

 RelPR = −1.255 dB.

As the interfering FM\_TV assignment is totally within the wanted assignment, no reduction in the protection ratio should be applied. Thus, the worst-case approach does not work correctly in this case either.

The limitation on the acceptable range of wanted bandwidth is 10.46 MHz to 85.1 MHz for Regions 1 and 3; 11.6 MHz to 49.6 MHz for Region 2. This limitation is based on the bandwidths of FM-TV assignments contained in the master database of Appendices **30** and **30A** (i.e. 27 MHz-33 MHz in Regions 1 and 3 and 24 MHz in case of Region 2).

In the treatment of satellite networks submitted under Article 4 of Appendices **30** and **30A**, whenever the submitted bandwidth falls outside the above-mentioned limits, the Bureau advises the notifying administration to modify the bandwidth to be within the limits. Notifying administrations have so far accepted the Bureau’s proposal. However, there is a need to operate wideband digital assignments for UHD-TV.

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| In view of the above, the Conference may wish to improve the worst-case approach so that it can accommodate wideband digital assignments. Alternatively, WRC-15 may decide to completely remove the requirement to apply the “worst-case approach” (i.e. the analogue assignments are treated as digital assignments). |

#### 3.2.6.10 Coordination criteria under § 9.7 for an incoming satellite network under Article 2A (Space Operation Function) in the 14.5-14.8 GHz frequency band

Section 2A.1.2 of Article 2A of Appendix 30A indicates that coordination among assignments intended to provide the space operation functions and services not subject to a Plan shall be effected using the provisions of Nos. 9.7, 9.17, 9.17A, 9.18 and the associated provisions of Section II of Article 9, as appropriate. Therefore, for the coordination of an incoming Article 2A network with an existing Article 2A network or with a non-planned FSS/BSS network, No. 9.7 applies.

For the coordination under No. 9.7, Appendix 5 in the remark column indicates that:

– in application of Article 2A of Appendix 30 for the space operation functions using the guardbands defined in § 3.9 Annex 5 of Appendix 30, the threshold/condition specified for the FSS in the bands 10.95-14.5 GHz applies, which is a coordination arc of ±7 degrees.

– in application of Article 2A of Appendix 30A for the space operation functions using the guardbands defined in § 3.1 and 4.1 of Annex 3 of Appendix 30A, the threshold/condition specified for the FSS in the bands above 17.3 GHz applies, which is a coordination arc of ±8 degrees.

Article 2A satellite network submissions in Regions 1 and 3 may include frequency assignments in the guardbands in both the 17.3 – 18.1 GHz and 14.5-14.8 GHz frequency bands.

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| In view of the above, the Conference may wish to confirm whether a coordination arc of ±8 degrees or Δ*T*/*T* criteria be applied for this type of coordination under No. 9.7 in the guardbands of the 14.5-14.8 GHz frequency band |

#### 3.2.6.11 Power density used for the calculation of Δ*T*/*T* under §2 of Annex 4 to Appendix 30A

Section 2 of Annex 4 to Appendix 30A specifies the threshold values for determining when coordination is required between transmitting feeder-link earth stations in the fixed-satellite service in Region 2 and a receiving space station subject to Appendix 30A in the frequency band 17.8-18.1 GHz. It indicates that Δ*T*/*T* of 6 % is used and that the Δ*T*/*T* is calculated in accordance with the method given in Appendix 8 except that the maximum power densities per hertz averaged over the worst 1 MHz are replaced by power densities per hertz averaged over the necessary bandwidth of the feeder-link carriers.

The power density per Hz averaged over necessary bandwidth (item c.8.h) is not required in submissions of parameters for non-planned satellite services in accordance with Appendix 4. Therefore, it is proposed to use the maximum power densities per hertz averaged over the worst 1 MHz in the Δ*T*/*T* calculation specified in Section 2 of Annex 4 to Appendix 30A.

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| The Conference may wish to confirm the above approach. |

### 3.2.7 Comments relating to RR Appendix 30B

#### 3.2.7.1 Provisional entry of converted assignment

When an assignment converted from an allotment in the Appendix **30B** Plan (with or without modification) enters in the List, it will replace the original allotment (i.e. the allotment will be deleted from the Plan). If that assignment is then cancelled in accordance with § 6.33 of Appendix **30B**, the allotment will be reinstated with the same orbital location and technical parameters of the cancelled assignment except for its service area.

The Bureau encountered a case where an assignment converted from an allotment received an unfavourable finding in the examinations under § 6.21 and § 6.22 of Appendix **30B** but the notifying administration requested the provisional entry of the assignments in the List in accordance with § 6.25 of Appendix **30B**. However, in case the assignment enters in the List provisionally has to be cancelled. It is not clear to the Bureau how to reinstate the assignment into allotment. As the characteristics of the assignments may not be compatible with the assignments that were the basis of unfavourable finding, it is not appropriate to simply reinstate the cancelled assignment into allotment in accordance with § 6.33.

In view of the above and in order to guarantee the integrity of the Plan, the Bureau decided that when an assignment converted from an allotment of Appendix **30B** Plan enters in the List provisionally, the initial allotment will not be suppressed from the Plan until the entry in the List of the assignment becomes definitive. When the converted assignment is reinstated, the notifying administration should choose either to keep its initial allotment in the Plan or reinstate with characteristics in the List to replace the initial allotment. In the latter case, the conditions described in § 6.26 to § 6.29 of Article 6 of Appendix **30B** shall continue to be applied to the reinstated allotment (i.e. has the same status of the cancelled assignment).

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| The Conference may wish to confirm this course of action. |

#### 3.2.7.2 Grid points generated over the service area at sea for examination under 2.2 of Annex 4 of Appendix 30B

WRC-07 introduced the examination on grid points under § 2.2 of Annex 4 of Appendix **30B** in order to properly protect the service area of allotments in the Appendix **30B** Plan and assignments in the List from incoming networks whose antenna diagrams contain a number of “holes” (very low antenna gain in a small area) towards certain specific downlink test points.

In implementing this examination in the Bureau’s GIBC software package, the grid points are regularly generated inside and along the border of the service area of interfered-with networks. If a service area includes sea, the grid points are also produced at sea. Consequently, the examination under § 2.2 of Annex 4 of Appendix **30B** provides protection on sea. On the other hand, the examinations under in the § 2.1 and § 2.3 of Annex 4 of Appendix **30B** involve only the *C*/*I* calculation at test points and the test points of a network are requested to be located on land, therefore the protection to theinterfered-with networks can only be afforded on land.

The Bureau wishes to draw the attention of WRC-15 to the above mentioned difference in various examinations under Annex 4 of Appendix **30B**.

It should be noted that the processing time of Bureau’s GIBC software may increase significantly if the area covered by sea is excluded from grid-generation.

#### 3.2.7.3 Submission of separate Appendix 4 notices under § 6.17 of Article 6 and § 8.1 of Article 8 of Appendix 30B

The existing provision under § 6.17 of Appendix **30B** states that “in submitting the notice, the administration may request the Bureau to examine the notice under §§ 6.19, 6.21 and 6.22 (entry into the List) and Article 8 (Notification)”. Some administrations understand that the Appendix **4** notice submitted under § 6.17 of Appendix **30B** is also valid for examination under Article 8 and therefore do not submit Appendix **4** data for Article 8 notices.

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| In order to clarify that administrations have to submit two separate Appendix **4** notices, instead of one notice, to request the Bureau to examine their network simultaneously under § 6.19, 6.21 and 6.22 (entry into the List) and Article 8 (Notification), the conference may wish to improve the provision text as follows: Option 1: MOD 6.17 If agreements have been reached with administrations published in accordance with § 6.7, the administration proposing the new or modified assignment may request the Bureau to have the assignment entered into the List, indicating the final characteristics of the assignment together with the names of the administrations with which agreement has been reached. For this purpose, it shall send to the Bureau the information specified in Appendix 4. In submitting the notice, the administration may request the Bureau to examine the notice under § 6.19, 6.21 and 6.22 (entry into the List) and then the notice submitted separately under Article 8 of this Appendix (notification).Option 2: MOD 6.17 If agreements have been reached with administrations published in accordance with § 6.7, the administration proposing the new or modified assignment may request the Bureau to have the assignment entered into the List, indicating the final characteristics of the assignment together with the names of the administrations with which agreement has been reached. For this purpose, it shall send to the Bureau the information specified in Appendix 4. In submitting the notice, the administration may request the Bureau to examine the notice under § 6.19, 6.21 and 6.22 (entry into the List). |

#### 3.2.7.4 Reference to the date of bringing into use in the Article 6 of Appendix 30B

In provision 6.31 of Appendix **30B**, reference is made to the planned date of bringing into use.

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| As this Appendix **4** data item is no longer required to be submitted for Article 6 notices, the Bureau proposes two options for consideration by the Conference:Option 1:MOD6.31 The regulatory time-limit for bringing into use of an assignment to a space station of a satellite network is no more than eight years from the date of receipt by the Bureau of the complete notice under § 6.1.Option 2:SUP6.31      (SUP WRC-15)MOD6.31*bis* The regulatory time-limit for bringing into use of an assignment to a space station of a satellite network is no more than eight years from the date of receipt by the Bureau of the complete notice under § 6.1 and may be extended once by not more than three years due to launch failure in the following cases:– the destruction of the satellite intended to bring the assignment into use;– the destruction of the satellite launched to replace an already operating satellite which is intended to be relocated to bring another assignment into use; *or* – the satellite is launched, but fails to reach its assigned orbital location. For this extension to be granted, the launch failure must have occurred at least five years after the date of receipt of the complete Appendix **4** data. In no case shall the period of the extension of the regulatory time-limit exceed the difference in time between the three-year period and the period remaining from the date of the launch failure to the end of the regulatory time-limit. In order to take advantage of this extension, the administration shall have, within one month of the launch failure, notified the Bureau in writing of such failure, and shall also provide the following information to the Bureau before the end of the regulatory time-limit:– date of launch failure;– due diligence information as required in Resolution **49 (Rev.WRC‑12)**, if this resolution applies to the satellite network in which the space station is to operate, for the assignments with respect to the satellite that suffered the launch failure, if that information has not already been provided.If, for a satellite network or satellite system to which Resolution **49 (Rev.WRC‑12)** applies, the administration has not provided to the Bureau updated Resolution **49 (Rev.WRC‑12)** information for the new satellite under procurement within one year of the request for extension, the related frequency assignments shall lapse.     (WRC‑15) |
| MOD6.32 Thirty days prior to the regulatory time-limit under § 6.31*bis*, the Bureau shall dispatch a reminder telegram or fax to the notifying administration which has not brought its assignment into use, bringing the matter to its attention.     (WRC‑15)MOD6.33When:i) an assignment is no longer required; *or*ii) an assignment recorded in the List and brought into use has been suspended for a period exceeding two years and ending after the expiry date specified in § 6.31*bis*; *or* ...MOD6.34 When a proposed new or modified frequency assignment has not fulfilled all the requirements for entering the List, in accordance with § 6.23 or 6.25, by the expiry date specified in § 6.31*bis* in the event of an extension under that provision, the Bureau shall publish in a Special Section of the BR IFIC the cancellation of the related Special Sections.    (WRC‑15)MOD8.13 A notice of a change in the characteristics of an assignment already recorded, as specified in Appendix **4**, shall be examined by the Bureau under § 8.8 and § 8.9, as appropriate. Any changes to the characteristics of an assignment that has been notified and confirmed as having been brought into use shall be brought into use within eight years from the date of the notification of the modification. Any changes to the characteristics of an assignment that has been notified but not yet brought into use shall be brought into use within the period provided for in § 6.31*bis* of Article 6.    (WRC‑15) |

#### 3.2.7.5 Entry of new allotment in the Plan; Update of Article 10 of Appendix 30B

WRC-15 may wish to update the Table in Article 10 of Appendix **30B** to reflect the changes of allotments since WRC-07, as indicated below. These changes already have been published in the BR IFIC and included in the Appendix **30B** master database.

Six administrations have obtained the new allotment through Article 7 of Appendix **30B** (see tables below).

4 500-4 800 MHz, 6 725-7 025 MHz

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| AZE00000 | 95.90 | 47.20 | 40.34 | 1.60 | 1.60 | 0.00 | −9.6 | −42.2 |   |
| BLR00000 | 64.40 | 27.01 | 53.60 | 1.60 | 1.60 | 0.00 | −9.4 | −41.3 |   |
| CZE00000 | −31.90 | 15.68 | 49.81 | 1.60 | 1.60 | 0.00 | −9.6 | −41.3 |   |
| KAZ00000 | 58.50 | 66.36 | 46.72 | 4.60 | 1.69 | 176.88 | −9.6 | −41.0 |   |
| LTU00000 | −9.30 | 23.67 | 55.23 | 1.60 | 1.60 | 0.00 | −9.6 | −42.8 |   |
| UZB00000 | 110.5 | 65.45 | 41.09 | 1.60 | 1.60 | 0.00 | −9.6 | −40.3 |   |

10.7-10.95 GHz, 11.20-11.45 GHz, 12.75-13.25 GHz

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| AZE00000 | 95.90 | 47.20 | 40.34 | 0.80 | 0.80 | 0.00 | −10.2 | −31.0 |   |
| BLR00000 | 64.40 | 27.01 | 53.60 | 1.14 | 0.80 | 25.74 | −3.0 | −30.0 |   |
| CZE00000 | −31.90 | 15.68 | 49.81 | 0.80 | 0.80 | 0.00 | −8.4 | −30.5 |   |
| KAZ00000 | 58.5 | 66.36 | 46.72 | 4.6 | 1.69 | 176.88 | −0.6 | −28.0 |   |
| LTU00000 | −9.3 | 23.67 | 55.23 | 0.8 | 0.8 | 0.00 | −10.2 | −32.5 |   |
| UZB00000 | 110.5 | 65.45 | 41.09 | 1.49 | 1.05 | 10.98 | −10.2 | −31.0 |   |

The allotment of five administrations were reinstated in application of § 6.33 *b)* or § 6.33 *c)* of Article 6 of Appendix **30B** as indicated in tables below.

4 500-4 800 MHz, 6 725-7 025 MHz

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| LBY00000 | 28.9 | 19 | 25.9 | 3.0 | 2.70 | 165 | −6.8 | −39.2 |  |
| MCO00000 | 52.0 |   |   |   |   |   | −15.6 | −28.7 | 3 |
| SEY00000 | 42.25 | 51.50 | −3.20 | 13.80 | 3.80 | 48.50 | −3.0 | −43.8 |   |
| VTN00000 | 107.00 |   |   |   |   |   | −7.1 | −35.8 | 3 |

10.7-10.95 GHz, 11.20-11.45 GHz, 12.75-13.25 GHz

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| LBY00000 | 28.9 | 19 | 25.9 | 3.0 | 2.70 | 165.0 | 3.1 | −27.8 |  |
| SEY00000 | 42.25 | 51.50 | −3.20 | 13.80 | 3.80 | 48.50 | −1.3 | −33.8 |  |
| RUS00002 | 88.1 |  |  |  |  |  | 5.4 | −26.32 | 3 |
| VTN00000 | 107.00 |   |   |   |   |   | 2.9 | −18.6 | 3 |

*Col. 10 Remark 3: Allotment converted into assignment with a shaped beam and then reinstated back into the Plan.*

The following allotments of two administrations have been converted into assignments and entered in the List of Appendix **30B**

4 500-4 800 MHz, 6 725-7 025 MHz

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| SDN00001 | 23.55 |  |  |  |  |  |  |  | 1 |
| SDN00002 | 23.55 |  |  |  |  |  |  |  | 1 |

10.7-10.95 GHz, 11.20-11.45 GHz, 12.75-13.25 GHz

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| SDN00001 | 23.55 |  |  |  |  |  |  |  | 1 |
| SDN00002 | 23.55 |  |  |  |  |  |  |  | 1 |
| MEX00000 | −113.0 |  |  |  |  |  |  |  | 1 |

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| The Conference may wish to modify Article 10 of Appendix 30B accordingly. |

#### 3.2.7.6 Suspension period of 3 years under § 8.17 of Article 8 of Appendix 30B

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| Following a decision of RRB12/60 to align the suspension period for a period of three years instead of two years, the Conference may wish to modify § 8.17 accordingly. (See also Document 3, Chapter 5, item 5/7/6) |

#### 3.2.7.7 Reinstatement of the frequency assignments of the CSDRN-M satellite network

During its 66th meeting, the RRB carefully considered the submission in Document RRB14-2/18 by the Administration of the Russian Federation requesting restoration of the CSDRN-M satellite network under Appendix **30B**. The administration had informed the Bureau by telefax on 24 December 2012 that the assignments of the network had been brought into use on 26 June 2012 and its operation had been suspended since 29 November 2012. The Bureau informed the administration that it would not take any action on information provided in that telefax as the notification for the CSDRN-M satellite network had not been received. On 22 November 2013 the Bureau received a notification under § 8.1 of Article 8 of Appendix **30B** with the initial date of bringing into use. The network had received an unfavourable finding under RR No. **11.44B** and had been suppressed by the Bureau in Special Section AP30B/A6A/65 SUP published in BR IFIC No. 2769 of 13 May 2014.

The RRB in the decision of the meeting, considered that the Bureau applied correctly the provisions of the Radio Regulations. The RRB however, given the information provided by the Administration of the Russian Federation that the network is in operation, providing safety of life services for manned space flights and the international space station and should not cause harmful interference to other networks, decided to restore the frequency assignments of the CSDRN-M satellite network.

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| The RRB also decided to bring this relaxation of No. **11.44B** of the Radio Regulations for this important network to the attention of WRC-15, through this Report, for endorsement of this decision by the Conference. |

### 3.2.8 Comments relating to Resolution 49 (Rev.WRC-07)

#### 3.2.8.1 Submission of Resolution 49 information after the date of BIU but prior to notification (§ 12 of Annex 1 to Resolution 49)

An administration notifying a satellite network under RR Article **11**, Article 5 of Appendices **30** and/or **30A** or Article 8 of Appendix **30B**, taking account of § 1, 2 or 3 of Annex 1 to Resolution **49 (Rev.WRC-12)** and in accordance with § 12 of Annex 1 to Resolution **49 (Rev.WRC-12)** “*shall send to the Bureau, as early as possible before the date of bringing into use the due diligence information relating to the identity of the satellite network and the launch services provider specified in Annex 2 to this Resolution*”.

Consequently, the Bureau understands that the due diligence information under Resolution **49 (Rev.WRC-12)** shall be received by the Bureau before the confirmed date of bringing into use. Otherwise it would not be in conformity with the provision of § 12 of Annex 1 to Resolution **49 (Rev.WRC-12)**.

However, in practice, the Bureau has experienced the situation when the due diligence information submission was received after the confirmed date of bringing into use.

Notwithstanding this regulatory order in the submission of information, a strict enforcement of conformity with § 12 of Annex 1 to Resolution **49** would result in the cancellation of the frequency assignments that are already brought into use or intended to be notified in time. Therefore, the Bureau, until further guidance, has been accepting due diligence information submissions received after the confirmed date of bringing into use in the notification submission.

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| The Conference may wish to consider this difficulty in application of § 12 of Annex 1 to Resolution **49 (Rev.WRC-12)**. |

#### 3.2.8.2 Reminder for the submission of the updated Resolution 49 information under § 4.1.3*bis* or § 4.2.6*bis* of Article 4 of Appendices 30 and 30A and § 6.31*bis* of Article 6 of Appendix 30B in case of launch failure

In accordance with § 10 of Annex 1 to Resolution **49**, if the notifying administration for a satellite network has not submitted the due diligence information before the expiry of the established period for bringing into use the space station frequency assignments, the Bureau shall send a reminder to the notifying administration six months before that date limit.

The regulatory time-limit for bringing into use of an assignment to a space station of a satellite network may be extended once by not more than three years due to launch failure in accordance with § 4.1.3*bis* or § 4.2.6*bis* of Article 4 of Appendices **30** and **30A** and § 6.31*bis* of Article 6 of Appendix **30B**. For such extension to be granted, the notifying administration shall provide to the Bureau updated Resolution **49** information for the new satellite under procurement within one year of the request for extension otherwise the related frequency assignments will lapse.

Taking the above into account there is a need to clarify whether the Bureau should send a reminder to the notifying administration and when the Bureau shall undertake such action before the expiry date of the one-year period to submit the updated Resolution **49** information in case of launch failure, in a similar approach as § 10 of Annex 1 to Resolution **49**.

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| If the Conference decides to request the Bureau to send a reminder to the notifying administration in the case of absence of updated Resolution **49** information, the following example modifications to § 4.1.3*bis* and § 4.2.6*bis* of Article 4 of Appendices **30** and **30A** and § 6.31*bis* of Article 6 of Appendix **30B** may be introduced:MOD Appendix 304.1.3*bis*…If, within one year of the request for extension, the administration has not provided to the Bureau updated Resolution **49 (Rev.WRC‑03)**[[4]](#footnote-4)\* information for the new satellite under procurement, the related frequency assignments shall lapse. In the absence of this updated information thirty days prior to the expiry of the one year period, the Bureau shall send a reminder to the notifying administration.     (WRC‑15)(*Editorial note:* Apply the same modification to § 4.2.6*bis* of Appendix **30**, § 4.1.3*bis* of Appendix **30A** and § 4.2.6*bis* of Appendix **30A**).MOD Appendix 30B6.31*bis* ...If, for a satellite network or satellite system to which Resolution **49 (Rev.WRC‑12)** applies, the administration has not provided to the Bureau updated Resolution **49 (Rev.WRC‑12)** information for the new satellite under procurement within one year of the request for extension, the related frequency assignments shall lapse. In the absence of this updated information thirty days prior to the expiry of the one year period, the Bureau shall send a reminder to the notifying administration.     (WRC‑15) |

#### 3.2.8.3 Reminder on the bringing into use of frequency assignments according to the extension period provided in § 4.1.3*bis* or § 4.2.6*bis* of Article 4 of Appendices 30 and 30A in case of launch failure

In order to harmonize the procedures in case of launch failure for Appendices **30**, **30A** and **30B** and since § 6.32 of Appendix **30B** establishes the need for the Bureau to send a reminder telefax thirty days prior to the expiry date of the extension period granted due to launch failure, the conference may wish to extend this procedure to Article 5 of Appendices **30** and **30A** in a similar manner.

|  |
| --- |
| An example of possible harmonized text to Article 5 of Appendices **30** and **30A** is provided below:MOD5.3.1 Any notified frequency assignment to which the Article 4 procedures have been applied and which has been provisionally recorded under § 5.2.7 shall be brought into use no later than the end of the period provided under § 4.1.3, 4.1.3*bis*, 4.2.6 or 4.2.6*bis* of Article 4. Any other frequency assignment provisionally recorded under § 5.2.7 shall be brought into use by the date specified in the notice. Unless the Bureau has been informed by the notifying administration of the bringing into use of the assignment under § 5.2.8, it shall, no later than fifteen days before the notified date of bringing into use or the end of the regulatory period established under § 4.1.3, 4.1.3*bis*, 4.2.6 or 4.2.6*bis* of Article 4, as appropriate, send a reminder requesting confirmation that the assignment has been brought into use within the regulatory period. If the Bureau does not receive that confirmation within thirty days following the notified date of bringing into use or the period provided under § 4.1.3, 4.1.3*bis*, 4.2.6 or 4.2.6*bis* of Article 4, as the case may be, it shall cancel the entry in the Master Register.     (WRC‑15) |

## 3.3 Electrically powered spacecraft propulsion

Electric propulsion is now a mature and widely used technology on spacecraft station keeping, orbit raising, or primary propulsion. Electrically-powered rocket engines provide however lower thrust compared to chemical rockets by several orders of magnitude because of the limited electrical power possible to provide in a spacecraft. As a consequence the time period related to the launch and early orbit phase from the geostationary transfer orbit to the final location on the geostationary satellite orbit may take a few months during which the frequency assignments for the control of the spacecraft may need to be better internationally recognized and protected.

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| The Conference is invited to consider the above issue and to take any relevant decisions, as it may wish. |

ANNEX 1

Frequency assignments used in space services with a direct or indirect
reference to the provisions of Article 48 of the Constitution

Fifteen administrations (AUS, B, CHN, D, F, I, IND, J, LUX, MEX, RUS, THA, TUR, UAE, USA) have so far requested for the application of Article 48 of the Constitution either with direct reference or indirectly by stating that the use of their frequency assignments to their satellite networks was for the purpose of national defence, military or governmental use. This comprises 120 satellite networks across 62 unique orbital positions.

The charts below show the distribution of frequency bands, services and nature of service of these networks understood to have a direct or indirect reference to provisions of Article 48 of the Constitution.

Frequency bands (MHz)



Frequency bands: 240-322, 335.4-399.9, 402.65-402.85, 1 215.6-1 239.6, 1 525-1 559, 1 563.42- 1 587.42, 1 627.5-1 630.5, 1 631.5-1 660.5, 1 765.725-1 769.725, 1 793.752-1 797.752, 1 801.76-1 805.76, 1 805.764-1 809.764, 1 809.768-1 813.768, 1 814.322-1 817.222, 1 821.779-1 825.779, 1 837.795-1 841.795, 2 028.5-2 030.5, 2 030.95-2 036.95, 2 037.5-2 047.5, 2 052.91-2 054.01, 2 054.02-2 056.22, 2 063.969-2 065.969, 2 067.5-2 090.49, 2 094.698-2 099.698, 2 102.5-2 107.5, 2 121-2 265.72, 2 266.05-2 268.95, 2 271-2 295, 2 500-2 520, 2 552-2 588, 2 592-2 628, 2 670-2 690, 3 031.7-3 032.3, 3 032.7-3 033.3, 3 040.7-3 041.3, 3 047.7-3 048.3, 3 048.7-3 049.3, 3 056.7-3 057.3, 3 064.7-3 065.3, 3 072.7-3 073.3, 3 080.7-3 081.3, 3 400-4 200, 4 400-4 800, 5 725-6 725, 7 250-7 750, 7 900-8 400, 10 702-11 700, 12 200-12 750, 13 400-13 640, 13 750-14 740, 14 760-15 340, 17 700-21 200, 21 400-22 000, 27 500-31 000, 42 505-42 595, 42 605-42 695, 42 705-42 795, 42 805-42 895, 42 905-42 995, 43 005-43 095, 43 105-43 195, 43 205-43 295, 43 305-43 395, 43 405-43 495, 43 500-45 600, 59 758-60 058, 60 156-60 456, 61 000-61 300, 61 902-62 202, 62 300-62 600 MHz

Services



Nature of service



\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. \* This revision only concerns Tables 1, 2 and 3 in sections 2.2.1, 2.2.2 and 2.2.3 respectively. Changes relate to the following pages of RR-12: Table 1: RR Volume 1: pages 37, 110, 124 and 260. RR Volume 2: pages 232, 240, 300 and 613. Table 2: RR Volume 1: page 287. There are also minor editorial changes in the referencing of the rows of the three tables. [↑](#footnote-ref-1)
2. See also Section 2.9 of Addendum 1 to Document CMR15/4, concerning Resolution 907 (WRC‑12). [↑](#footnote-ref-2)
3. \* *Nota de la Secretaría*: esta Resolución fue revisada por la CMR-07. [↑](#footnote-ref-3)
4. \* *Note by the Secretariat:* This Resolution was revised by WRC‑07 and WRC‑12.

\*\* *Note by the Secretariat:* This Resolution was abrogated by WRC‑12. [↑](#footnote-ref-4)