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# Harmful Interference and Infringements of the Radio Regulations

*ITU – Radiocommunication Bureau*



# Introduction

The radio-frequency spectrum and satellite orbits are limited natural resources to which all countries have equal rights.

The primary objective of the ITU-R is to enable radiocommunication services to operate without causing interference.

This presentation relates to the measures against interference and the procedures to be followed for resolving problems of harmful interference and infringements.

# Statistics of Harmful interference

45 cases of harmful interference received in 2013:

- 8 cases concerning space services
  - 3 requests for assistance of the BR;
  - 5 cases for information.
- 37 cases concerning terrestrial services
  - 10 cases related to safety services;
  - 14 request for assistance of the BR;
  - 13 cases for information.

# Causes of Harmful interference

- Out of band emissions;
- Operation of non-coordinated frequency assignments (Broadcasting service and land mobile service);
- Non-observance of limits of frequency tolerances or maximum permitted power levels for spurious emissions;
- Operating with different technical parameters from those recorded in Plans or the Master Register;
- Unnecessary transmissions;
- Unauthorised emissions, etc.

# Report of Harmful interference (Appendix 10 to the RR)

| API0-1  | API0-2  |
|---|---|
| <p>APPENDIX 10 (Rev.WRC-07)<br/><b>Report of harmful interference</b><br/>(See Article 15, Section VI)</p> <p><i>Particulars concerning the station causing the interference:</i></p> <p><i>a</i> Name, call sign or other means of identification .....</p> <p><i>b</i> Frequency measured .....</p> <p style="padding-left: 20px;">Date: .....</p> <p style="padding-left: 20px;">Time (UTC): .....</p> <p><i>c</i> Class of emission<sup>1</sup> .....</p> <p><i>d</i> Bandwidth (indicate whether measured or estimated) .....</p> <p><i>e</i> Measured field strength or power flux-density<sup>2</sup> .....</p> <p style="padding-left: 20px;">Date: .....</p> <p style="padding-left: 20px;">Time (UTC): .....</p> <p><i>f</i> Observed polarization .....</p> <p><i>g</i> Class of station and nature of service .....</p> <p><i>h</i> Location/position/area/bearing (QTE)<sup>3</sup> (WRC-07) .....</p> <p><i>i</i> Location of the facility which made the above measurements .....</p> <p><i>Particulars concerning the transmitting station interfered with:</i></p> <p><i>j</i> Name, call sign or other means of identification .....</p> <p><i>k</i> Frequency assigned .....</p> | <p><i>l</i> Frequency measured .....</p> <p style="padding-left: 20px;">Date: .....</p> <p style="padding-left: 20px;">Time (UTC): .....</p> <p><i>m</i> Class of emission<sup>4</sup> .....</p> <p><i>n</i> Bandwidth (indicate whether measured or estimated, or indicate the necessary bandwidth notified to the Radiocommunication Bureau) .....</p> <p><i>o</i> Location/position/area .....</p> <p><i>p</i> Location of the facility which made the above measurements .....</p> <p><i>Particulars furnished by the receiving station experiencing the interference:</i></p> <p><i>q</i> Name of station .....</p> <p><i>r</i> Location/position/area .....</p> <p><i>s</i> Dates and times (UTC) of occurrence of harmful interference .....</p> <p><i>t</i> Bearings (QTE)<sup>5</sup> or other particulars (WRC-07) .....</p> <p><i>u</i> Nature of interference .....</p> <p><i>v</i> Field strength or power flux-density of the wanted emission at the receiving station experiencing the interference<sup>6</sup> .....</p> <p style="padding-left: 20px;">Date: .....</p> <p style="padding-left: 20px;">Time (UTC): .....</p> <p><i>w</i> Polarization of the receiving antenna or observed polarization .....</p> <p><i>x</i> Action requested .....</p> <p><small>NOTE – For convenience and brevity, telegraphic reports shall be in the format above, using the letters in the order listed in lieu of the explanatory titles, but only those letters for which information is provided should be used. However, sufficient information shall be provided to the administration receiving the report, so that an appropriate investigation can be conducted.</small></p> |
| <p><small><sup>1</sup> The class of emission shall contain the basic characteristics listed in Appendix 1. If any characteristic cannot be determined, indicate the unknown symbol with a dash. However, if a station is not able to identify unambiguously whether the modulation is frequency or phase modulation, indicate frequency modulation (F).</small></p> <p><small><sup>2</sup> When measurements are not available, signal strength according to the QSA scale should be provided.</small></p> <p><small><sup>3</sup> See the most recent version of Recommendation ITU-R M.1172. (WRC-07)</small></p>  | <p><small><sup>4</sup> See footnote 1.</small></p> <p><small><sup>5</sup> See footnote 3.</small></p> <p><small><sup>6</sup> See footnote 2.</small></p>  |

# Infringement of the Radio Regulations

- 9 cases received in 2013 (all concerning terrestrial services, none of them concerns safety services).
- Infringements shall be reported to administrations using forms similar to the specimen given in Appendix 9. (No. 15.19)
- Representations relating to infringement shall be made to the administration of the country having jurisdiction over the station infringing the Radio Regulations, by the administrations which detect it. (No. 15.20)
- Provision No. 15.21 stipulates that “if an administration has information of an infringement of the Constitution, the Convention or the Radio Regulations (in particular Article 45 of the Constitution and No. 15.1 of the Radio Regulations) committed by a station under its jurisdiction, the administration shall ascertain the facts and take the necessary actions”. (WRC-12).

# Report of an irregularity or infringement (Appendix 9 to the RR)

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| <p style="text-align: center;"><b>APPENDIX 9</b></p> <p style="text-align: center;"><b>Report of an irregularity or infringement</b></p> <p style="text-align: center;">(See Article 15, Section V)</p> <p><i>Particulars concerning the station infringing the Radio Regulations:</i></p> <p>1 Name<sup>1</sup> if known (in BLOCK letters) .....</p> <p>2 Call sign or other identification (in BLOCK letters) .....</p> <p>3 Nationality, if known .....</p> <p>4 Frequency used (kHz, MHz, GHz or THz) .....</p> <p>5 Class of emission<sup>2</sup> .....</p> <p>6 Class of station and nature of service, if known .....</p> <p>7 Location<sup>3, 4, 5</sup> .....</p> <p><i>Particulars concerning the station, the centralizing office or inspection service reporting the irregularity or infringement:</i></p> <p>8 Name (in BLOCK letters) .....</p> <p>9 Call sign or other identification (in BLOCK letters) .....</p> <p>10 Nationality .....</p> <p>11 Location<sup>3, 4</sup> .....</p> <p><i>Particulars of the irregularity or infringement:</i></p> <p>12 Name<sup>6</sup> of the station (in BLOCK letters) in communication with the station committing the irregularity or infringement .....</p> <p>13 Call sign or other identification (in BLOCK letters) of the station in communication with the station committing the irregularity or infringement .....</p> | <p style="text-align: center;"><b>AP9-1</b></p> <p style="text-align: center;"><b>AP9-2</b></p> <p>14 Date and time<sup>7</sup> .....</p> <p>15 Nature of the irregularity or infringement<sup>8</sup> .....</p> <p>16 Extracts from ship log or other information supporting the report .....</p> <p><i>Particulars concerning the transmitting station interfered with:</i></p> <p>17 Name of the station (in BLOCK letters) .....</p> <p>18 Call sign or other identification (in BLOCK letters) .....</p> <p>19 Frequency assigned (kHz, MHz, GHz or THz) .....</p> <p>20 Frequency measured at the time of the interference .....</p> <p>21 Class of emission<sup>2</sup> and bandwidth (indicate whether measured or estimated, or indicate the necessary bandwidth notified to the Radiocommunication Bureau) .....</p> <p>22 Receiving location<sup>3, 4</sup> (in BLOCK letters) where the interference was experienced .....</p> <p>23 Certificate:</p> <p>I certify that the foregoing report represents, to the best of my knowledge, a complete and accurate account of what took place. ....</p> <p style="text-align: right;">Signatures<sup>10</sup> ..... Date: .....</p> |
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# Measures against interference (Constitution)

Several provisions of the Constitution relate to measures that are incumbent on Members in order to avoid harmful interference.

- Members are bound to abide by the provisions of the Constitution, the Convention and the Radio Regulations in stations established or operated by them which are capable of causing harmful interference to radio services of other countries. (No. 37)
- Members are also bound to take the necessary steps to impose the observance of the provisions of the Constitution, the Convention and the Radio Regulations upon operating agencies authorized by them which operate stations capable of causing harmful interference to the radio services of other countries. (No. 38)



# Measures against interference (Constitution)

- All stations must be established and operated in such a manner as not to cause harmful interference to the radio services or communications of other Members which operate in accordance with the provisions of the Radio Regulations. (No. 197)
- Each Member undertakes to require its operating agencies to observe the provisions of No. 197. (No. 198)

# Measures against interference (Radio Regulations)

The Radio Regulations contains provisions to be applied with a view to minimizing the risk of interference.

- As stipulated by No. 197 of the Constitution, all stations must be established and operated in such a manner as not to cause harmful interference to stations of other Members which operate in accordance with the Radio Regulations. (No. 0.4)
- Article 3 deals with the technical specifications to be met by stations in order to avoid interference.
  - The choice and performance of equipment to be used in a station and any emissions therefrom shall satisfy the provisions of these Regulations. (No. 3.1)
  - Transmitting stations must conform to the frequency tolerances specified in Appendix 2 and to the maximum permitted power levels for spurious emissions in Appendix 3. (Nos. 3.5 and 3.6)

# Measures against interference (Radio Regulations)

Article 4 sets out the general rules to be applied in regard to the assignment and use of frequencies.

- In assigning frequencies to stations which are capable of causing harmful interference to stations of another country, Members shall make such assignments in accordance with the Table of Frequency Allocations and other provisions of the Radio Regulations. (No. 4.2)
- Any new assignment or modification of an existing assignment shall be made in such a way as to avoid causing harmful interference to stations using frequencies assigned in accordance with the Radio Regulations and whose characteristics are recorded in the Master Register. (No. 4.3)

# Measures against interference (Radio Regulations)

- No assignment shall be made to any station in derogation of the Radio Regulations, except on the express condition that such a station, when using such a frequency assignment, shall not cause harmful interference or claim protection. (No. 4.4)
- It is possible to notify such a non-conforming assignment and enter it in the Master Register, for information only.

# Measures against interference (Radio Regulations)

- No. 4.5 stipulates that “the frequency assigned to a station of a given service shall be separated from the limits of the band allocated to this service in such a way that, taking account of the frequency band assigned to a station, no harmful interference is caused to services to which frequency bands immediately adjoining are allocated”.
- This precaution has to be taken in order to avoid any overlapping with an assignment conforming to the Table of Allocations.
- In the assignment and use of frequencies, it is necessary to take into account the fact that safety services require special measures to ensure their freedom from harmful interference. (No. 4.10)

# Measures against interference (Radio Regulations)

The Radio Regulations contains provisions which define some hierarchy among the various services and which determine the priority that assignments of such services may have over other assignments (please see Nos. 5.28 to 5.31).

- Stations of a secondary service shall not cause harmful interference to stations of a primary service and cannot claim protection from harmful interference from stations of a primary service;
- Stations of a secondary service can claim protection from harmful interference from stations of the same service or other secondary services.

# Measures against interference (Radio Regulations)

## Status of frequency assignments

- No. 8.1 provides that “The international rights and obligations of administrations in respect of their own and other administrations’ frequency assignments shall be derived from the recording of those assignments in the Master Register or from their conformity, where appropriate, with a plan ...”.
- Any frequency assignment recorded in the Master Register with a favourable finding under No. 11.31 shall have the right to international recognition. This right means that other administrations shall take it into account when making their own assignments, in order to avoid harmful interference. (No. 8.3)
- If the use of a frequency assignment is capable of causing harmful interference to any service of another administration, this assignment shall be notified to the Bureau, as stipulated in No. 11.3.

# Measures against interference (Radio Regulations)

Article 15 of the Radio Regulations contains a certain number of specific provisions to be applied with a view to avoiding interference.

- All stations are forbidden to carry out unnecessary transmissions, or the transmission of superfluous signals, etc. (No. 15.1)
- Transmitting stations shall radiate only as much power as is necessary to ensure a satisfactory service. (No 15.2)
- The conditions specified under Nos. 15.3 to 15.7 shall be fulfilled.
- Special consideration shall be given to avoiding interference on distress and safety frequencies. (No. 15.8)



# Procedure in a case of Harmful interference

- The procedure in a case of harmful interference is set forth in Section VI of Article 15 of the Radio Regulations.
- The problems of harmful interference are to be resolved on the basis of goodwill and mutual assistance, as stipulated in provision No. 15.22.
- Administrations shall cooperate in the detection and elimination of harmful interference, employing where appropriate the facilities described in Article 16 (the international monitoring system).
- Where practicable, the case of harmful interference may be dealt with directly by their monitoring stations or between the operators.
- Full particulars relating to harmful interference shall be given in the form indicated in Appendix 10. (No. 15.27)

# Procedure in a case of Harmful interference

- As stipulated by No.15.41, “if it is considered necessary, and particularly if the steps taken in accordance with the procedures described above have not produced satisfactory results, the administration concerned shall forward details of the case to the Bureau for its information.”
- In such a case, request of assistance may also be sent to the BR with all the technical and operational details and copies of the correspondence. (No. 15.42)
- In case of request of assistance , the Bureau contacts the responsible administration in order to resolve the matter. If the harmful interference persists, the Bureau prepares a report for consideration by the Radio Regulations Board.

# Conclusions

- It is essential that Members exercise the utmost goodwill and mutual assistance in the application of the provisions of Article 15 of the Radio Regulations to the settlement of problems of harmful interference.
- The main objective of the Radio Regulations is to prevent harmful interference between stations. Members are obliged to adhere strictly to the provisions of the Radio Regulations for all stations under their responsibility.
- While it is true that spectrum management is a sovereign matter for each Member, the fact remains that radio waves are able to cross borders. In order to avoid harmful interference, it is necessary to coordinate the use of radio-frequency spectrum at the borders.

# Thank you for your attention!

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