International Telecommunication Union

2012 World Radiocommunication Conference

Agenda and References
(Resolutions and Recommendations)

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PREFACE

The forthcoming World Radiocommunication Conference that will take place in Geneva in 2012 will be a triggering event for the radiocommunication world and the frequency management sphere.

So as to try to better assist you in your preparations for the conference, I would like to present to you this booklet that offers, not only the agenda for the WRC-12, but also all pertinent resolutions and recommendations that are referenced therein.

I confess that I have been inspired by the initiative of the International Amateur Radio Union that first presented a similar document and take this opportunity to convey my appreciation to the IAU.

I wish all of the participants to this exceptional event enlightening discussions based on a spirit of deep cooperation that will obviously lead, as for past events, to a most successful outcome.

Valery Timofeev
Director, Radiocommunication Bureau

CONTENTS

According to Council Resolution 1291 (MOD),
the dates, venue and agenda for the next

World Radiocommunication Conference,
Geneva, 23 January-17 February 2012,

preceded by the

Radiocommunication Assembly,

Geneva, 16-20 January 2012,

have been confirmed. The text of the Resolution
is contained in Document C08/89(Rev.1)
and is provided for your convenience.

Document C08/89(Rev.1)-E
9 September 2009
Original: English

RESOLUTION 1291 (MOD)
(adopted by correspondence)

Place, dates and agenda of the World Radiocommunication Conference (WRC-12)

The Council,

noting

that Resolution 805 of the World Radiocommunication Conference (Geneva, 2007):

a) resolved to recommend to the Council that a world radiocommunication conference be held in 2011 for a period of four weeks;

b) recommended its agenda, and invited the Council to finalize the agenda and arrange for the convening of WRC-11 and to initiate as soon as possible the necessary consultation with Member States,

resolves

to convene a World Radiocommunication Conference (WRC-12) in Geneva (Switzerland) from 23 January to 17 February 2012, preceded by the Radiocommunication Assembly from 16 to 20 January 2012, with the following agenda:

1 on the basis of proposals from administrations, taking account of the results of WRC-07 and the Report of the Conference Preparatory Meeting, and with due regard to the requirements of existing and future services in the bands under consideration, to consider and take appropriate action with respect to the following items:

1.1 to consider and take appropriate action on requests from administrations to delete their country footnotes or to have their country name deleted from footnotes, if no longer required, taking into account Resolution **26 (Rev.WRC-07)**;

1.2 taking into account the ITU-R studies carried out in accordance with Resolution **951 (Rev.WRC-07)**, to take appropriate action with a view to enhancing the international regulatory framework;

1.3 to consider spectrum requirements and possible regulatory actions, including allocations, in order to support the safe operation of unmanned aircraft systems (UAS), based on the results of ITU-R studies, in accordance with Resolution **421 (WRC-07)**;

1.4 to consider, based on the results of ITU-R studies, any further regulatory measures to facilitate introduction of new aeronautical mobile (R) service (AM(R)S) systems in the bands 112-117.975 MHz, 960-1 164 MHz and 5 000-5 030 MHz in accordance with Resolutions **413 (Rev.WRC-07)**, **417 (WRC-07)** and **420 (WRC-07)**;

1.5 to consider worldwide/regional harmonization of spectrum for electronic news gathering (ENG), taking into account the results of ITU-R studies, in accordance with Resolution **954 (WRC-07)**;

1.6 to review No. **5.565** of the Radio Regulations in order to update the spectrum use by the passive services between 275 GHz and 3 000 GHz, in accordance with Resolution **950 (Rev.WRC-07)**, and to consider possible procedures for free-space optical-links, taking into account the results of ITU-R studies, in accordance with Resolution **955 (WRC-07)**;

1.7 to consider the results of ITU-R studies in accordance with Resolution **222 (Rev.WRC-07)** in order to ensure long-term spectrum availability and access to spectrum necessary to meet requirements for the aeronautical mobile-satellite (R) service, and to take appropriate action on this subject, while retaining unchanged the generic allocation to the mobile-satellite service in the bands 1 525-1 559 MHz and 1 626.5-1 660.5 MHz;

1.8 to consider the progress of ITU-R studies concerning the technical and regulatory issues relative to the fixed service in the bands between 71 GHz and 238 GHz, taking into account Resolutions **731 (WRC-2000)** and **732 (WRC-2000)**;

1.9 to revise frequencies and channelling arrangements of Appendix 17 to the Radio Regulations, in accordance with Resolution **351 (Rev.WRC-07)**, in order to implement new digital technologies for the maritime mobile service;

1.10 to examine the frequency allocation requirements with regard to operation of safety systems for ships and ports and associated regulatory provisions, in accordance with Resolution **357 (WRC-07)**;

1.11 to consider a primary allocation to the space research service (Earth-to-space) within the band 22.55-23.15 GHz, taking into account the results of ITU-R studies, in accordance with Resolution **753 (WRC-07)**;

1.12 to protect the primary services in the band 37-38 GHz from interference resulting from aeronautical mobile service operations, taking into account the results of ITU-R studies, in accordance with Resolution **754 (WRC-07)**;

1.13 to consider the results of ITU-R studies in accordance with Resolution **551 (WRC-07)** and decide on the spectrum usage of the 21.4-22 GHz band for the broadcasting-satellite service and the associated feeder-link bands in Regions 1 and 3;

1.14 to consider requirements for new applications in the radiolocation service and review allocations or regulatory provisions for implementation of the radiolocation service in the range 30-300 MHz, in accordance with Resolution **611 (WRC-07)**;

1.15 to consider possible allocations in the range 3-50 MHz to the radiolocation service for oceanographic radar applications, taking into account the results of ITU-R studies, in accordance with Resolution **612 (WRC-07)**;

1.16 to consider the needs of passive systems for lightning detection in the meteorological aids service, including the possibility of an allocation in the frequency range below 20 kHz, and to take appropriate action, in accordance with Resolution **671 (WRC-07)**;

1.17 to consider results of sharing studies between the mobile service and other services in the band 790-862 MHz in Regions 1 and 3, in accordance with Resolution **749 (WRC-07)**, to ensure the adequate protection of services to which this frequency band is allocated, and take appropriate action;

1.18 to consider extending the existing primary and secondary radiodetermination-satellite service (space-to-Earth) allocations in the band 2 483.5-2 500 MHz in order to make a global primary allocation, and to determine the necessary regulatory provisions based upon the results of ITU-R studies, in accordance with Resolution **613 (WRC-07)**;

1.19 to consider regulatory measures and their relevance, in order to enable the introduction of software-defined radio and cognitive radio systems, based on the results of ITU-R studies, in accordance with Resolution **956 (WRC-07)**;

1.20 to consider the results of ITU-R studies and spectrum identification for gateway links for high altitude platform stations (HAPS) in the range 5 850-7 075 MHz in order to support operations in the fixed and mobile services, in accordance with Resolution **734 (Rev.WRC-07)**;

1.21 to consider a primary allocation to the radiolocation service in the band 15.4-15.7 GHz, taking into account the results of ITU-R studies, in accordance with Resolution **614 (WRC-07)**;

1.22 to examine the effect of emissions from short-range devices on radiocommunication services, in accordance with Resolution **953 (WRC-07)**;

1.23 to consider an allocation of about 15 kHz in parts of the band 415-526.5 kHz to the amateur service on a secondary basis, taking into account the need to protect existing services;

1.24 to consider the existing allocation to the meteorological-satellite service in the band 7 750-7 850 MHz with a view to extending this allocation to the band 7 850-7 900 MHz, limited to non-geostationary meteorological satellites in the space-to-Earth direction, in accordance with Resolution **672 (WRC-07)**;

1.25 to consider possible additional allocations to the mobile-satellite service, in accordance with Resolution **231 (WRC-07)**;

2 to examine the revised ITU-R Recommendations incorporated by reference in the Radio Regulations communicated by the Radiocommunication Assembly, in accordance with Resolution **28 (Rev.WRC-03)**, and to decide whether or not to update the corresponding references in the Radio Regulations, in accordance with principles contained in the Annex 1 to Resolution **27 (Rev.WRC-07)**;

3 to consider such consequential changes and amendments to the Radio Regulations as may be necessitated by the decisions of the Conference;

4 in accordance with Resolution **95 (Rev.WRC-07)**, to review the resolutions and recommendations of previous conferences with a view to their possible revision, replacement or abrogation;

5 to review, and take appropriate action on, the Report from the Radiocommunication Assembly submitted in accordance with Nos. 135 and 136 of the Convention;

6 to identify those items requiring urgent action by the Radiocommunication Study Groups in preparation for the next world radiocommunication conference;

7 to consider possible changes in response to Resolution 86 (Rev. Marrakesh, 2002) of the Plenipotentiary Conference: "Advance publication, coordination, notification and recording procedures for frequency assignments pertaining to satellite networks", in accordance with Resolution **86 (Rev.WRC-07)**;

8 in accordance with Article 7 of the Convention:

8.1 to consider and approve the Report of the Director of the Radiocommunication Bureau:

8.1.1 on the activities of the Radiocommunication Sector since WRC-07;

8.1.2 on any difficulties or inconsistencies encountered in the application of the Radio Regulations; and

8.1.3 on action in response to Resolution **80 (Rev.WRC-07)**;

8.2 to recommend to the Council items for inclusion in the agenda for the next WRC, and to give its views on the preliminary agenda for the subsequent conference and on possible agenda items for future conferences, taking into account Resolution **806 (WRC-07)**,

instructs the Director of the Radiocommunication Bureau

to make the necessary arrangements to convene meetings of the Conference Preparatory Meeting and the Special Committee on Regulatory/ Procedural Matters and to prepare a report to WRC-12,

instructs the Secretary-General

1 to make all the necessary arrangements, in agreement with the Director of the Radiocommunication Bureau, for the convening of the Conference;

2 to communicate this Resolution to international and regional organizations concerned.

RESOLUTION 805 (WRC-07)

Agenda for the 2011 World Radiocommunication Conference

The World Radiocommunication Conference (Geneva, 2007),

considering

a) that, in accordance with No. 118 of the ITU Convention, the general scope of the agenda for a world radiocommunication conference should be established four to six years in advance and a final agenda shall be established by the Council two years before the conference;

b) Article 13 of the ITU Constitution relating to the competence and scheduling of world radiocommunication conferences and Article 7 of the Convention relating to their agendas;

c) the relevant resolutions and recommendations of previous world administrative radio conferences (WARCs) and world radiocommunication conferences (WRCs),

recognizing

a) that this Conference has identified a number of urgent issues requiring further examination by WRC-11;

b) that, in preparing this agenda, many items proposed by administrations could not be included and have had to be deferred to future conference agendas,

resolves

to recommend to the Council that a world radiocommunication conference be held in 2011 for a period of four weeks, with the following agenda:

1 on the basis of proposals from administrations, taking account of the results of WRC-07 and the Report of the Conference Preparatory Meeting, and with due regard to the requirements of existing and future services in the bands under consideration, to consider and take appropriate action with respect to the following items:

1.1 to consider and take appropriate action on requests from administrations to delete their country footnotes or to have their country name deleted from footnotes, if no longer required, taking into account Resolution **26 (Rev.WRC-07)**;

1.2 taking into account the ITU-R studies carried out in accordance with Resolution **951 (Rev.WRC-07)**, to take appropriate action with a view to enhancing the international regulatory framework;

1.3 to consider spectrum requirements and possible regulatory actions, including allocations, in order to support the safe operation of unmanned aircraft systems (UAS), based on the results of ITU-R studies, in accordance with Resolution **421 (WRC-07)**;

1.4 to consider, based on the results of ITU-R studies, any further regulatory measures to facilitate introduction of new aeronautical mobile (R) service (AM(R)S) systems in the bands 112-117.975 MHz, 960-1 164 MHz and 5 000-5 030 MHz in accordance with Resolutions **413 (Rev.WRC-07)**, **417 (WRC-07)** and **420 (WRC-07)**;

1.5 to consider worldwide/regional harmonization of spectrum for electronic news gathering (ENG), taking into account the results of ITU-R studies, in accordance with Resolution **954 (WRC-07)**;

1.6 to review No. **5.565** of the Radio Regulations in order to update the spectrum use by the passive services between 275 GHz and 3 000 GHz, in accordance with Resolution **950 (Rev.WRC-07)**, and to consider possible procedures for free-space optical-links, taking into account the results of ITU-R studies, in accordance with Resolution **955 (WRC-07)**;

1.7 to consider the results of ITU-R studies in accordance with Resolution **222 (Rev.WRC-07)** in order to ensure long-term spectrum availability and access to spectrum necessary to meet requirements for the aeronautical mobile-satellite (R) service, and to take appropriate action on this subject, while retaining unchanged the generic allocation to the mobile-satellite service in the bands 1 525-1 559 MHz and 1 626.5-1 660.5 MHz;

1.8 to consider the progress of ITU-R studies concerning the technical and regulatory issues relative to the fixed service in the bands between 71 GHz and 238 GHz, taking into account Resolutions **731 (WRC-2000)** and **732 (WRC-2000)**;

1.9 to revise frequencies and channelling arrangements of Appendix **17** to the Radio Regulations, in accordance with Resolution **351 (Rev.WRC-07)**, in order to implement new digital technologies for the maritime mobile service;

1.10 to examine the frequency allocation requirements with regard to operation of safety systems for ships and ports and associated regulatory provisions, in accordance with Resolution **357 (WRC-07)**;

1.11 to consider a primary allocation to the space research service (Earth-to-space) within the band 22.55-23.15 GHz, taking into account the results of ITU-R studies, in accordance with Resolution **753 (WRC-07)**;

1.12 to protect the primary services in the band 37-38 GHz from interference resulting from aeronautical mobile service operations, taking into account the results of ITU-R studies, in accordance with Resolution **754 (WRC-07)**;

1.13 to consider the results of ITU-R studies in accordance with Resolution **551 (WRC-07)** and decide on the spectrum usage of the 21.4-22 GHz band for the broadcasting-satellite service and the associated feeder-link bands in Regions 1 and 3;

1.14 to consider requirements for new applications in the radiolocation service and review allocations or regulatory provisions for implementation of the radiolocation service in the range 30-300 MHz, in accordance with Resolution **611 (WRC-07)**;

1.15 to consider possible allocations in the range 3-50 MHz to the radiolocation service for oceanographic radar applications, taking into account the results of ITU-R studies, in accordance with Resolution **612 (WRC-07)**;

1.16 to consider the needs of passive systems for lightning detection in the meteorological aids service, including the possibility of an allocation in the frequency range below 20 kHz, and to take appropriate action, in accordance with Resolution **671 (WRC-07)**;

1.17 to consider results of sharing studies between the mobile service and other services in the band 790-862 MHz in Regions 1 and 3, in accordance with Resolution **749 (WRC-07)**, to ensure the adequate

protection of services to which this frequency band is allocated, and take appropriate action;

1.18 to consider extending the existing primary and secondary radiodetermination-satellite service (space-to-Earth) allocations in the band 2 483.5-2 500 MHz in order to make a global primary allocation, and to determine the necessary regulatory provisions based upon the results of ITU-R studies, in accordance with Resolution **613 (WRC-07)**;

1.19 to consider regulatory measures and their relevance, in order to enable the introduction of software-defined radio and cognitive radio systems, based on the results of ITU-R studies, in accordance with Resolution **956 (WRC-07)**;

1.20 to consider the results of ITU-R studies and spectrum identification for gateway links for high altitude platform stations (HAPS) in the range 5 850-7 075 MHz in order to support operations in the fixed and mobile services, in accordance with Resolution **734 (Rev.WRC-07)**;

1.21 to consider a primary allocation to the radiolocation service in the band 15.4-15.7 GHz, taking into account the results of ITU-R studies, in accordance with Resolution **614 (WRC-07)**;

1.22 to examine the effect of emissions from short-range devices on radiocommunication services, in accordance with Resolution **953 (WRC-07)**;

1.23 to consider an allocation of about 15 kHz in parts of the band 415-526.5 kHz to the amateur service on a secondary basis, taking into account the need to protect existing services;

1.24 to consider the existing allocation to the meteorological-satellite service in the band 7 750-7 850 MHz with a view to extending this allocation to the band 7 850-7 900 MHz, limited to non-geostationary meteorological satellites in the space-to-Earth direction, in accordance with Resolution **672 (WRC-07)**;

1.25 to consider possible additional allocations to the mobile-satellite service, in accordance with Resolution **231 (WRC-07)**;

2 to examine the revised ITU-R Recommendations incorporated by reference in the Radio Regulations communicated by the Radiocommunication Assembly, in accordance with Resolution **28 (Rev.WRC-03)**, and to decide whether or not to update the corresponding references in the Radio Regulations, in accordance with principles contained in the Annex 1 to Resolution **27 (Rev.WRC-07)**;

3 to consider such consequential changes and amendments to the Radio Regulations as may be necessitated by the decisions of the Conference;

4 in accordance with Resolution **95 (Rev.WRC-07)**, to review the resolutions and recommendations of previous conferences with a view to their possible revision, replacement or abrogation;

5 to review, and take appropriate action on, the Report from the Radiocommunication Assembly submitted in accordance with Nos. 135 and 136 of the Convention;

6 to identify those items requiring urgent action by the Radiocommunication Study Groups in preparation for the next world radiocommunication conference;

7 to consider possible changes in response to Resolution 86 (Rev. Marrakesh, 2002) of the Plenipotentiary Conference: "Advance publication, coordination, notification and recording procedures for frequency assignments pertaining to satellite networks", in accordance with Resolution **86 (Rev.WRC-07)**;

8 in accordance with Article 7 of the Convention:

8.1 to consider and approve the Report of the Director of the Radiocommunication Bureau:

8.1.1 on the activities of the Radiocommunication Sector since WRC-07;

8.1.2 on any difficulties or inconsistencies encountered in the application of the Radio Regulations; and

8.1.3 on action in response to Resolution **80 (Rev.WRC-07)**;

8.2 to recommend to the Council items for inclusion in the agenda for the next WRC, and to give its views on the preliminary agenda for the subsequent conference and on possible agenda items for future conferences, taking into account Resolution **806 (WRC-07)**,

resolves further

to activate the Conference Preparatory Meeting and the Special Committee on Regulatory/ Procedural Matters,

invites the Council

to finalize the agenda and arrange for the convening of WRC-11, and to initiate as soon as possible the necessary consultations with Member States,

instructs the Director of the Radiocommunication Bureau

to make the necessary arrangements to convene meetings of the Conference Preparatory Meeting and to prepare a report to WRC-11,

instructs the Secretary-General

to communicate this Resolution to international and regional organizations concerned.

RESOLUTION 806 (WRC-07)

Preliminary agenda for the 2015 World Radiocommunication Conference

The World Radiocommunication Conference (Geneva, 2007),

considering

a) that, in accordance with No. 118 of the ITU Convention, the general scope of the agenda for WRC-15 should be established four to six years in advance;

b) Article 13 of the ITU Constitution relating to the competence and scheduling of world radiocommunication conferences and Article 7 of the Convention relating to their agendas;

c) the relevant resolutions and recommendations of previous world administrative radio conferences (WARCs) and world radiocommunication conferences (WRCs),

resolves to give the view

that the following items should be included in the preliminary agenda for WRC-15:

1 to take appropriate action in respect of those urgent issues that were specifically requested by WRC-11;

2 on the basis of proposals from administrations and the Report of the Conference Preparatory Meeting, and taking account of the results of WRC-11, to consider and take appropriate action in respect of the following items:

2.1 to consider spectrum requirements and possible additional spectrum allocations in the radiodetermination service to support the operation of unmanned aerial systems (UAS) in non-segregated airspace;

2.2 to review the use of the band 5 091-5 150 MHz by the fixed-satellite service (Earth-to-space) (limited to feeder links of the non-GSO mobile-satellite service) in accordance with Resolution **114 (Rev.WRC-03)**;

3 to examine the revised ITU-R Recommendations incorporated by reference in the Radio Regulations communicated by the Radiocommunication Assembly, in accordance with Resolution **28 (Rev.WRC-03)**, and to decide whether or not to update the corresponding references in the Radio Regulations, in accordance with the principles contained in Annex 1 to Resolution **27 (Rev.WRC-07)**;

4 to consider such consequential changes and amendments to the Radio Regulations as may be necessitated by the decisions of the Conference;

5 in accordance with Resolution **95 (Rev.WRC-07)**, to review the resolutions and recommendations of previous conferences with a view to their possible revision, replacement or abrogation;

6 to review, and take appropriate action on, the Report from the Radiocommunication Assembly submitted in accordance with Nos. 135 and 136 of the Convention;

7 to identify those items requiring urgent action by the Radiocommunication Study Groups;

8 to consider possible changes in response to Resolution 86 (Rev. Marrakesh, 2002) of the Plenipotentiary Conference: "Advance publication, coordination, notification and recording procedures for frequency assignments pertaining to satellite networks", in accordance with Resolution **86 (Rev.WRC-07)**;

9 in accordance with Article 7 of the Convention:

9.1 to consider and approve the Report of the Director of the Radiocommunication Bureau on the activities of the Radiocommunication Sector since WRC-11;

9.2 to recommend to the Council items for inclusion in the agenda for the following WRC,

invites the Council

to consider the views given in this Resolution,

instructs the Director of the Radiocommunication Bureau

to make the necessary arrangements to convene meetings of the Conference Preparatory Meeting and to prepare a report to WRC-15,

instructs the Secretary-General

to communicate this Resolution to international and regional organizations concerned.

RESOLUTION 26 (Rev.WRC-07)

Footnotes to the Table of Frequency Allocations in Article 5 of the Radio Regulations

The World Radiocommunication Conference (Geneva, 2007),

considering

a) that footnotes are an integral part of the Table of Frequency Allocations in the Radio Regulations and, as such, form part of an international treaty text;

b) that footnotes to the Table of Frequency Allocations should be clear, concise and easy to understand;

c) that footnotes should relate directly to matters of frequency allocation;

d) that, in order to ensure that footnotes allow modification of the Table of Frequency Allocations without introducing unnecessary complications, principles relating to the use of footnotes are needed;

e) that, currently, footnotes are adopted by competent world radiocommunication conferences and any addition, modification or deletion of a footnote is considered and adopted by the competent conference;

f) that some problems concerning country footnotes may be resolved through the application of a special agreement envisaged by Article **6**;

g) that, in certain cases, administrations are confronted with major difficulties due to inconsistencies or omissions in footnotes;

h) that, in order to keep the footnotes to the Table of Frequency Allocations up to date, there should be clear and effective guidelines for additions, modifications and deletions of footnotes,

resolves

1 that, wherever possible, footnotes to the Table of Frequency Allocations should be confined to altering, limiting or otherwise changing the relevant allocations rather than dealing with the operation of stations, assignment of frequencies or other matters;

2 that the Table of Frequency Allocations should include only those footnotes which have international implications for the use of the radio-frequency spectrum;

3 that new footnotes to the Table of Frequency Allocations should only be adopted in order to:

a) achieve flexibility in the Table of Frequency Allocations;

b) protect the relevant allocations in the body of the Table and in other footnotes in accordance with Section II of Article 5;

c) introduce either transitional or permanent restrictions on a new service to achieve compatibility; or

d) meet the specific requirements of a country or area when it is impracticable to satisfy such needs otherwise within the Table of Frequency Allocations;

4 that footnotes serving a common purpose should be in a common format, and, where possible, be grouped into a single footnote with appropriate references to the relevant frequency bands,

further resolves

1 that any addition of a new footnote or modification of an existing footnote should be considered by a world radiocommunication conference only when:

a) the agenda of that conference explicitly includes the frequency band to which the proposed additional or modified footnote relates; or

b) the frequency bands to which the desired additions or modifications of the footnote belong are considered during the conference and the conference decides to make a change in those bands; or

c) the addition or modification of footnotes is specifically included in the agenda of the conference as a result of the consideration of proposals submitted by one or more interested administration(s);

2 that recommended agendas for future world radiocommunication conferences should include a standing agenda item which would allow for the consideration of proposals by administrations for deletion of country footnotes, or country names in footnotes, if no longer required;

3 that in cases not covered by *further resolves* 1 and 2, proposals for new footnotes or modification of existing footnotes could exceptionally be considered by a world radiocommunication conference if they concern corrections of obvious omissions, inconsistencies, ambiguities or editorial errors and have been submitted to ITU as stipulated in No. 40 of the General Rules of Conferences, Assemblies and Meetings of the Union (Antalya, 2006),

urges administrations

1 to review footnotes periodically and to propose the deletion of their country footnotes or of their country names from footnotes, as appropriate;

2 to take account of the *further resolves* above in making proposals to world radiocommunication conferences.

RESOLUTION 27 (Rev.WRC-07)

Use of incorporation by reference in the Radio Regulations

The World Radiocommunication Conference (Geneva, 2007),

considering

a) that the principles of incorporation by reference were adopted by WRC-95, revised by WRC-97 and further refined by WRC-2000 (see Annexes 1 and 2 to this Resolution);

b) that there are provisions in the Radio Regulations containing references which fail to distinguish adequately whether the status of the referenced text is mandatory or non-mandatory,

noting

that references to Resolutions or Recommendations of a world radiocommunication conference (WRC) require no special procedures, and are acceptable for consideration, since such texts will have been agreed by a WRC,

resolves

1 that for the purposes of the Radio Regulations, the term "incorporation by reference" shall only apply to those references intended to be mandatory;

2 that when considering the introduction of new cases of incorporation by reference, such incorporation shall be kept to a minimum and made by applying the following criteria:

– only texts which are relevant to a specific WRC agenda item may be considered;

– the correct method of reference shall be determined on the basis of the principles set out in Annex 1 to this Resolution;

– the guidance contained in Annex 2 to this Resolution shall be applied in order to ensure that the correct method of reference for the intended purpose is employed;

3 that the procedure described in Annex 3 to this Resolution shall be applied for approving the incorporation by reference of ITU-R Recommendations or parts thereof;

4 that existing references to ITU-R Recommendations shall be reviewed to clarify whether the reference is mandatory or non-mandatory in accordance with Annex 2 to this Resolution;

5 that ITU-R Recommendations, or parts thereof, incorporated by reference at the conclusion of each WRC shall be collated and published in a volume of the Radio Regulations (see Annex 3 to this Resolution),

instructs the Director of the Radiocommunication Bureau

1 to bring this Resolution to the attention of the Radiocommunication Assembly and the ITU-R Study Groups;

2 to identify the provisions and footnotes of the Radio Regulations containing references to ITU-R Recommendations and make suggestions on any further action to the second session of the Conference Preparatory Meeting (CPM) for its consideration, as well as for inclusion in the Director's Report to the next WRC;

3 to identify the provisions and footnotes of the Radio Regulations containing references to WRC Resolutions that contain references to ITU-R Recommendations, and make suggestions on any further action to the second session of the Conference Preparatory Meeting (CPM) for its consideration, as well as for inclusion in the Director's Report to the next WRC,

invites administrations

to submit proposals to future conferences, taking into account the CPM Report, in order to clarify the status of references, where ambiguities remain regarding the mandatory or non-mandatory status of the references in question, with a view to amending those references:

i) that appear to be of a mandatory nature, identifying such references as being incorporated by reference by using clear linking language in accordance with Annex 2;

ii) that are of a non-mandatory character, so as to refer to "the most recent version" of the Recommendations.

ANNEX 1 TO RESOLUTION 27 (Rev.WRC-07)

Principles of incorporation by reference

1 For the purposes of the Radio Regulations, the term "incorporation by reference" shall apply only to those references intended to be mandatory.

2 Where the relevant texts are brief, the referenced material should be placed in the body of the Radio Regulations rather than using incorporation by reference.

3 Where a mandatory reference to an ITU-R Recommendation, or parts thereof, is included in the *resolves* of a WRC Resolution, which is itself cited in a provision or footnote of the Radio Regulations using mandatory language (i.e. "shall"), that ITU-R Recommendation or parts thereof shall also be considered as incorporated by reference.

4 Texts which are of a non-mandatory nature or which refer to other texts of a non-mandatory nature shall not be considered for incorporation by reference.

5 If, on a case-by-case basis, it is decided to incorporate material by reference on a mandatory basis, then the following provisions shall apply:

5.1 the text incorporated by reference shall have the same treaty status as the Radio Regulations themselves;

5.2 the reference must be explicit, specifying the specific part of the text (if appropriate) and the version or issue number;

5.3 the text incorporated by reference must be submitted for adoption by a competent WRC in accordance with *resolves* 3;

5.4 all texts incorporated by reference shall be published following a WRC, in accordance with *resolves* 5.

6 If, between WRCs, a text incorporated by reference (e.g. an ITU-R Recommendation) is updated, the reference in the Radio Regulations shall continue to apply to the earlier version incorporated by reference until such time as a competent WRC agrees to incorporate the new version. The mechanism for considering such a step is given in Resolution **28 (Rev.WRC-03)**.

ANNEX 2 TO RESOLUTION 27 (Rev.WRC-07)

Application of incorporation by reference

When introducing new cases of incorporation by reference in the provisions of the Radio Regulations or reviewing existing cases of incorporation by reference, administrations and ITU-R should address the following factors in order to ensure that the correct method of reference is employed for the intended purpose, according to whether each reference is mandatory (i.e. incorporated by reference), or non-mandatory:

Mandatory references

1 mandatory references shall use clear linking language, i.e. “shall”;

2 mandatory references shall be explicitly and specifically identified, e.g. “Recommendation ITU-R M.541-8”;

3 if the intended reference material is, as a whole, unsuitable as treaty-status text, the reference shall be limited to just those portions of the material in question which are of a suitable nature, e.g. “Annex A to Recommendation ITU-R Z.123-4”.

Non-mandatory references

4 Non-mandatory references or ambiguous references that are determined to be of a non-mandatory character (i.e. not incorporated by reference) shall use appropriate language, such as "should" or "may". This appropriate language may refer to "the most recent version" of a Recommendation. Any appropriate language may be changed at any future WRC.

ANNEX 3 TO RESOLUTION 27 (Rev.WRC-07)

Procedures applicable by WRC for approving the incorporation by reference of ITU-R Recommendations or parts thereof

The referenced texts shall be made available to delegations in sufficient time for all administrations to consult them in the ITU languages. A single copy of the texts shall be made available to each administration as a conference document.

During the course of each WRC, a list of the texts incorporated by reference shall be developed and maintained by the committees. This list shall be published as a conference document in line with developments during the conference.

Following the end of each WRC, the Bureau and General Secretariat will update the volume of the Radio Regulations which serves as the repository of texts incorporated by reference in line with developments at the conference as recorded in the above-mentioned document.

RESOLUTION 28 (Rev.WRC-03)

Revision of references to the text of ITU-R Recommendations incorporated by reference in the Radio Regulations

The World Radiocommunication Conference (Geneva, 2003),

considering

a) that the Voluntary Group of Experts (VGE) on simplification of the Radio Regulations proposed the transfer of certain texts of the Radio Regulations to other documents, especially to ITU-R Recommendations, using the incorporation by reference procedure;

b) that, in some cases, the provisions of the Radio Regulations imply an obligation on Member States to conform to the criteria or specifications incorporated by reference;

c) that references to incorporated texts shall be explicit and shall refer to a precisely identified provision (see Resolution **27 (Rev.WRC-03)**[*]);

d) that all texts of ITU-R Recommendations incorporated by reference are published in a volume of the Radio Regulations;

e) that, taking into account the rapid evolution of technology, ITU-R may revise the ITU-R Recommendations containing text incorporated by reference at short intervals;

f) that, following revision of an ITU-R Recommendation containing text incorporated by reference, the reference in the Radio Regulations shall continue to apply to the earlier version until such time as a competent world radiocommunication conference (WRC) agrees to incorporate the new version;

g) that it would be desirable that texts incorporated by reference reflect the most recent technical developments,

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[*] *Note by the Secretariat:* This Resolution was revised by WRC-07.

noting

that administrations need sufficient time to examine the potential consequences of changes to ITU-R Recommendations containing text incorporated by reference and would therefore benefit greatly from being advised, as early as possible, of which ITU-R Recommendations have been revised and approved during the elapsed study period or at the Radiocommunication Assembly preceding the WRC,

resolves

1 that each radiocommunication assembly shall communicate to the following WRC a list of the ITU-R Recommendations containing text incorporated by reference in the Radio Regulations which have been revised and approved during the elapsed study period;

2 that, on this basis, WRC should examine those revised ITU-R Recommendations, and decide whether or not to update the corresponding references in the Radio Regulations;

3 that, if the WRC decides not to update the corresponding references, the currently referenced version shall be maintained in the Radio Regulations;

4 that WRCs shall place the examination of ITU-R Recommendations in conformity with *resolves* 1 and *resolves* 2 of this Resolution on the agenda of future WRCs,

instructs the Director of the Radiocommunication Bureau

to provide the CPM immediately preceding each WRC with a list, for inclusion in the CPM Report, of those ITU-R Recommendations containing texts incorporated by reference that have been revised or approved since the previous WRC, or that may be revised in time for the following WRC,

urges administrations

1 to participate actively in the work of the radiocommunication study groups and the radiocommunication assembly on revision of those Recommendations to which mandatory references are made in the Radio Regulations;

2 to examine any indicated revisions of ITU-R Recommendations containing text incorporated by reference and to prepare proposals on possible updating of relevant references in the Radio Regulations.

RESOLUTION 80 (Rev.WRC-07)

Due diligence in applying the principles embodied in the Constitution

The World Radiocommunication Conference (Geneva, 2007),

considering

a) that Articles 12 and 44 of the Constitution lay down the basic principles for the use of the radio-frequency spectrum and the geostationary-satellite and other satellite orbits;

b) that those principles have been included in the Radio Regulations;

c) that Article I of the Agreement between the United Nations and the International Telecommunication Union provides that "the United Nations recognizes the International Telecommunication Union (hereinafter called "the Union") as the specialized agency responsible for taking such action as may be appropriate under its basic instrument for the accomplishment of the purposes set forth therein";

d) that, in accordance with Nos. **11.30**, **11.31** and **11.31.2**, notices shall be examined with respect to the provisions of the Radio Regulations, including the provision relating to the basic principles, appropriate rules of procedure being developed for the purpose;

e) that WRC-97 instructed the Radio Regulations Board (RRB) to develop, within the framework of Nos. **11.30**, **11.31** and **11.31.2**, rules of procedure to be followed in order to be in compliance with the principles in No. **0.3** of the Preamble to the Radio Regulations;

f) that the Board, in accordance with Resolution **80 (WRC-97)**, submitted a report to WRC-2000 suggesting possible solutions and stating that, after examining the Radio Regulations, it had concluded that there are no provisions currently in the Radio Regulations that link the formal notification or coordination procedures with the principles stated in No. **0.3** of the Preamble to the Radio Regulations;

g) that the Legal Subcommittee of the Committee on the Peaceful Uses of Outer Space of the United Nations General Assembly has drawn up recommendations in this respect,

noting

a) that, in accordance with the provisions of No. 127 of the Convention, the Conference may give instructions to the Sectors of the Union;

b) that, according to No. 160C of the Convention, the Radiocommunication Advisory Group (RAG) shall review any matter as directed by a conference;

c) the RRB report to WRC-2000 (see Annex 1);

d) the RRB report to WRC-03 (see Annex 2);

e) that some of the issues identified in the report referred to in *noting c)* have been resolved before WRC-07,

resolves

1 to instruct the Radiocommunication Sector, in accordance with No. 1 of Article 12 of the Constitution, to carry out studies on procedures for measurement and analysis of the application of the basic principles contained in Article 44 of the Constitution;

2 to instruct the RRB to consider and review possible draft recommendations and draft provisions linking the formal notification, coordination and registration procedures with the principles contained in Article 44 of the Constitution and No. **0.3** of the Preamble to the Radio Regulations, and to report to each future World Radiocommunication Conference with regard to this Resolution;

3 to instruct the Director of the Radiocommunication Bureau to submit to each future World Radiocommunication Conference a detailed progress report on the action taken on this Resolution,

invites

1 the other organs of the Radiocommunication Sector, in particular the RAG, to make relevant contributions to the Director of the Radiocommunication Bureau for inclusion in his report to each future World Radiocommunication Conference;

2 administrations to contribute to the studies referred to in *resolves* 1 and to the work of the RRB as detailed in *resolves* 2.

ANNEX 1 TO RESOLUTION 80 (Rev.WRC-07)

RRB Report to WRC-2000

In the RRB Report to WRC-2000[1], several members of the Board noted some difficulties likely to be experienced by administrations, particularly administrations of developing countries, as follows:

– the "first-come first-served" concept restricts and sometimes prevents access to and use of certain frequency bands and orbit positions;

– a relative disadvantage for developing countries in coordination negotiations due to various reasons such as a lack of resources and expertise;

– perceived differences in consistency of application of the Radio Regulations;

– the submitting of "paper" satellites that restricts access options;

– the growing use of the bands of the Plans of Appendices **30** and **30A** by regional, multichannel systems, which may modify the main purpose of these Plans to provide equitable access to all countries;

– the considerable processing delays in the Radiocommunication Bureau are due to the very complex procedures required and the large number of filings submitted; these delays contribute to a coordination backlog of 18 months which could extend to three years and creates uncertain regulatory situations, additional delay in the coordination process that cannot be overcome by administrations, and the possible loss of the assignment because the allotted time is exceeded;

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[1] This Report can be found in Document 29 to WRC-2000.

– satellite systems may already be in orbit before completion of coordination;

– statutory time-frames, such as those in No. **11.48**, may often be insufficient for developing countries to be able to complete the regulatory requirements as well as the design, construction and launch of satellite systems;

– no provisions for international monitoring to confirm the bringing into use of satellite networks (assignments and orbits).

ANNEX 2 TO RESOLUTION 80 (Rev.WRC-07)

RRB Report to WRC-03

In the RRB Report to WRC-03[2], concepts to satisfy *resolves* 2 of Resolution **80 (WRC-2000)** were provided, as follows:

– special measures for countries submitting their first satellite filing:

  – on an exceptional basis, special consideration could be given to countries submitting their first filing for a satellite system, taking into account the special needs of developing countries;

  – such consideration should take into account the following:

    – impact on other administrations;

    – satellite service of the system (i.e. FSS, MSS, BSS);

    – frequency band covered by the filing;

    – system is intended to meet the direct needs of the country(s) concerned;

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2 This Report can be found in Addendum 5 to Document 4 to WRC-03.

– extension of the regulatory time-limit for bringing into use:

  – conditions could be specified under which extensions might be granted on an exceptional basis to developing countries when they are not able to complete the regulatory date requirements, so that sufficient time for design, construction and launch of satellite systems is made available;

  – the conditions created under the previous paragraph should be included in the Radio Regulations as provisions that would allow the Radiocommunication Bureau to grant the extension.

RESOLUTION 86 (Rev.WRC-07)

Implementation of Resolution 86 (Rev. Marrakesh, 2002) of the Plenipotentiary Conference

The World Radiocommunication Conference (Geneva, 2007),

considering

a) that the Plenipotentiary Conference (Marrakesh, 2002) discussed the application of Resolution 86 (Minneapolis, 1998) and decided to request WRC-03 to determine the scope and criteria to be used by future world radiocommunication conferences (WRCs) in the application of Resolution 86 (Rev. Marrakesh, 2002);

b) that the Plenipotentiary Conference (Antalya, 2006) invited WRC-07 to consider Resolution 86 (Marrakesh, 2002) and to report the results to the 2010 Plenipotentiary Conference,

recognizing

that the Radio Regulations Board makes suggestions to transform the content of the Rules of Procedure into a regulatory text in accordance with Nos. **13.0.1** and **13.0.2** of Article **13** of the Radio Regulations,

noting

that administrations may also wish to make proposals to transform the content of the Rules of Procedure into a regulatory text for possible inclusion in the Radio Regulations,

resolves to invite future world radiocommunication conferences

1 to consider any proposals which deal with deficiencies and improvements in the advance publication, coordination, notification and recording procedures of the Radio Regulations for frequency assignments pertaining to space services which have either been identified by the Board and included in the Rules of Procedure or which have been identified by administrations or by the Radiocommunication Bureau, as appropriate;

2 to ensure that these procedures, and the related appendices of the Radio Regulations reflect the latest technologies, as far as possible,

invites administrations

to consider, in preparing for PP-10, appropriate action with regard to Resolution 86 (Rev. Marrakesh, 2002).

RESOLUTION 86 (Rev. Marrakesh, 2002)

Advance publication, coordination, notification and recording procedures for frequency assignments pertaining to satellite networks

The Plenipotentiary Conference of the International Telecommunication Union (Marrakesh, 2002),

considering

a) that the Voluntary Group of Experts (VGE) created to study allocation and improved use of the radio-frequency spectrum and the simplification of the Radio Regulations proposed changes to the Radio Regulations, including the coordination and notification procedures for satellite networks, with the aim of simplifying the procedures;

b) that Resolution 18 (Kyoto, 1994) of the Plenipotentiary Conference instructed the Director of the Radiocommunication Bureau (BR) to initiate a review of some issues concerning international satellite network coordination;

c) that the World Radiocommunication Conference (Geneva, 1997) adopted changes to the Radio Regulations that entered into force 1 January 1999;

d) that the coordination and notification procedures for satellite networks are the foundation for discharging the ITU's role and mandate in space telecommunication matters;

e) that the scope of application of this resolution has already been extended beyond its intended objectives;

f) that there are no criteria for how this resolution is to be applied in order to properly achieve the objectives set forth therein,

considering further

that it is important that these procedures be kept as current and simple as possible in order to reduce the cost for administrations and BR,

noting

a) that all matters relating to administrative due diligence are covered in Resolution 85 (Minneapolis, 1998) of the Plenipotentiary Conference and Resolution 49 (Rev. WRC-2000) of the World Radiocommunication Conference;

b) Resolution 80 (Rev. WRC-2000) of the World Radiocommunication Conference, regarding due diligence in applying the principles embodied in the ITU Constitution,

resolves to request the 2003 and subsequent world radiocommunication conferences

to review and update the advance publication, coordination, notification and recording procedures for frequency assignments pertaining to satellite networks, including the associated technical characteristics, and the related appendices of the Radio Regulations, so as to:

i) facilitate, in accordance with Article 44 of the Constitution, the rational, efficient, and economical use of radio frequencies and any associated orbits, including the geostationary-satellite orbit, in conformity with the provisions of the Radio Regulations, so that countries or groups of countries may have equitable access to those orbits and frequencies, taking into account the special needs of the developing countries and the geographical situation of particular countries;

ii) ensure that these procedures, characteristics and appendices reflect the latest technologies;

iii) achieve simplification and cost savings for BR and administrations,

further resolves to request the 2003 World Radiocommunication Conference

to determine the scope and the criteria to be used for the implementation of this resolution.

RESOLUTION 95 (Rev.WRC-07)

General review of the Resolutions and Recommendations of world administrative radio conferences and world radiocommunication conferences

The World Radiocommunication Conference (Geneva, 2007),

considering

a) that it is important to keep the Resolutions and Recommendations of past world administrative radio conferences and world radiocommunication conferences under constant review, in order to keep them up to date;

b) that the reports of the Director of the Radiocommunication Bureau submitted to previous conferences provided a useful basis for a general review of the Resolutions and Recommendations of past conferences;

c) that some principles and guidelines are necessary for future conferences to treat the Resolutions and Recommendations of previous conferences which are not related to the agenda of the Conference,

resolves to invite future competent world radiocommunication conferences

1 to review the Resolutions and Recommendations of previous conferences that are related to the agenda of the Conference with a view to their possible revision, replacement or abrogation and to take appropriate action;

2 to review the Resolutions and Recommendations of previous conferences that are not related to any agenda item of the Conference with a view to:

– abrogating those Resolutions and Recommendations that have served their purpose or have become no longer necessary;

– reviewing the need for those Resolutions and Recommendations, or parts thereof, requesting ITU-R studies on which no progress has been made during the last two periods between conferences;

– updating and modifying Resolutions and Recommendations, or parts thereof that have become out of date, and to correct obvious omissions, inconsistencies, ambiguities or editorial errors and effect any necessary alignment;

3 at the beginning of the conference, to determine which committee within the conference has the primary responsibility to review each of the Resolutions and Recommendations referred to in *resolves* 1 and 2 above,

instructs the Director of the Radiocommunication Bureau

1 to conduct a general review of the Resolutions and Recommendations of previous conferences and, after consultation with the Radiocommunication Advisory Group and the Chairmen and Vice-Chairmen of the Radiocommunication Study Groups, submit a report to the second session of the Conference Preparatory Meeting (CPM) in respect of *resolves* 1 and *resolves* 2, including an indication of any associated agenda items;

2 to include in the above report, with the cooperation of the chairmen of the Radiocommunication Study Groups, the progress reports of ITU-R studies on the issues which have been requested by the Resolutions and Recommendations of previous conferences, but which are not placed on the agendas of the forthcoming two conferences,

invites administrations

to submit contributions on the implementation of this Resolution to CPM,

invites the Conference Preparatory Meeting

to include, in its Report, the results of the general review of the Resolutions and Recommendations of previous conferences, based on the contributions by administrations to CPM, in order to facilitate the follow-up by future WRCs.

RESOLUTION 114 (Rev.WRC-03)

Studies on compatibility between new systems of the aeronautical radionavigation service and the fixed-satellite service (Earth-to-space) (limited to feeder links of the non-geostationary mobile-satellite systems in the mobile-satellite service) in the frequency band 5 091-5 150 MHz

The World Radiocommunication Conference (Geneva, 2003),

considering

a) the current allocation of the frequency band 5000-5250 MHz to the aeronautical radionavigation service;

b) the requirements of both the aeronautical radionavigation and the fixed-satellite (FSS) (Earth-to-space) (limited to feeder links of non-geostationary satellite (non-GSO) systems in the mobile-satellite service (MSS)) services in the above-mentioned band,

recognizing

a) that precedence must be given to the microwave landing system (MLS) in accordance with No. **5.444** and to other international standard systems of the aeronautical radionavigation service in the frequency band 5030-5150 MHz;

b) that, in accordance with Annex 10 of the Convention of the International Civil Aviation Organization (ICAO) on international civil aviation, it may be necessary to use the frequency band 5091-5150 MHz for the MLS if its requirements cannot be satisfied in the frequency band 5030-5091 MHz;

c) that the FSS providing feeder links for non-GSO systems in the MSS will need access to the frequency band 5091-5150 MHz in the short term,

noting

a) that Recommendation ITU-R S.1342 describes a method for determining coordination distances between international standard MLS

stations operating in the band 5 030-5 091 MHz and FSS earth stations providing Earth-to-space feeder links in the band 5 091-5 150 MHz;

b) the small number of FSS stations to be considered;

c) the development of new systems that will provide supplemental navigation information integral to the aeronautical radionavigation service,

resolves

1 that administrations authorizing stations providing feeder links for non-GSO systems in the MSS in the frequency band 5091-5150 MHz shall ensure that they do not cause harmful interference to stations of the aeronautical radionavigation service;

2 that the allocation to the aeronautical radionavigation service and the FSS in the frequency band 5091-5150 MHz should be reviewed at a future competent conference prior to 2018;

3 that studies be undertaken on compatibility between new systems of the aeronautical radionavigation service and systems of the FSS providing feeder links of the non-GSO systems in the MSS (Earth-to-space),

invites administrations

when assigning frequencies in the band 5091-5150 MHz before 1 January 2018 to stations of the aeronautical radionavigation service or to stations of the FSS providing feeder links of the non-GSO systems in the MSS (Earth-to-space), to take all practicable steps to avoid mutual interference between them,

invites ITU-R

to study the technical and operational issues relating to sharing of this band between new systems of the aeronautical radionavigation service and the FSS providing feeder links of the non-GSO systems in the MSS (Earth-to-space),

invites

1 ICAO to supply technical and operational criteria suitable for sharing studies for new aeronautical systems;

2 all Members of the Radiocommunication Sector, and especially ICAO, to participate actively in such studies,

instructs the Secretary-General

to bring this Resolution to the attention of ICAO.

RESOLUTION 222 (Rev.WRC-07)

Use of the bands 1525-1559 MHz and 1626.5-1660.5 MHz by the mobile-satellite service, and studies to ensure long-term spectrum availability for the aeronautical mobile-satellite (R) service

The World Radiocommunication Conference (Geneva, 2007),

considering

a) that prior to WRC-97, the bands 1530-1544 MHz (space-to-Earth) and 1626.5-1645.5 MHz (Earth-to-space) were allocated to the maritime mobile-satellite service and the bands 1545-1555 MHz (space-to-Earth) and 1646.5-1656.5 MHz (Earth-to-space) were allocated on an exclusive basis to the aeronautical mobile-satellite (R) service (AMS(R)S) in most countries;

b) that WRC-97 allocated the bands 1525-1559 MHz (space-to-Earth) and 1626.5-1660.5 MHz (Earth-to-space) to the mobile-satellite service (MSS) to facilitate the assignment of spectrum to multiple MSS systems in a flexible and efficient manner;

c) that WRC-97 adopted No. **5.353A** giving priority to accommodating spectrum requirements for and protecting from unacceptable interference distress, urgency and safety communications of the Global Maritime Distress and Safety System (GMDSS) in the bands 1530-1544 MHz and 1626.5-1645.5 MHz and No. **5.357A** giving priority to accommodating spectrum requirements for and protecting from unacceptable interference the AMS(R)S providing transmission of messages with priority categories 1 to 6 in Article **44** in the bands 1545-1555 MHz and 1646.5-1656.5 MHz;

d) that AMS(R)S is an essential element of ICAO CNS/ATM to provide safety and regularity of flight in the civil air transportation,

further considering

a) that coordination between satellite networks is required on a bilateral basis in accordance with the Radio Regulations, and, in the bands 1525-1559 MHz (space-to-Earth) and 1626.5-1660.5 MHz (Earth-to-space), coordination is partially assisted by regional multilateral meetings;

b) that, in these bands, geostationary satellite system operators currently use a capacity-planning approach at multilateral coordination meetings, with the guidance and support of their administrations, to periodically coordinate access to the spectrum needed to accommodate their requirements;

c) that spectrum requirements for MSS networks, including the GMDSS and AMS(R)S, are currently accommodated through the capacity-planning approach and that, in the bands to which Nos. **5.353A** or **5.357A** apply, this approach, and other methods may assist in accommodating the expected increase of spectrum requirements for GMDSS and AMS(R)S;

d) that Report ITU-R M.2073 has concluded that prioritization and inter-system pre-emption between different mobile-satellite systems is not practical and, without a significant advance in technology, is unlikely to be feasible for technical, operational and economical reasons. It summarized that prioritization and intersystem real-time pre-emption would not necessarily increase the efficiency of spectrum use compared to the current situation, but it would certainly complicate substantially the coordination process and network structure;

e) that there is existing and increasing demand for spectrum for AMS(R)S and non-AMS(R)S by several mobile satellite systems in the bands 1525-1559 MHz and 1626.5-1660.5 MHz, and that the application of this Resolution may impact the provision of services by non-AMS(R)S systems in the mobile satellite service;

f) that future requirements for AMS(R)S and GMDSS spectrum may require additional allocations,

recognizing

a) that absolute priority to all telecommunications concerning safety of life at sea, on land, in air or in outer space is given by No. 191 of the ITU Constitution;

b) that the International Civil Aviation Organization (ICAO) has adopted Standards and Recommended Practices (SARPs) addressing satellite communications with aircraft in accordance with the Convention on International Civil Aviation;

c) that all air traffic communications as defined in Annex 10 to the Convention on International Civil Aviation fall within priority categories 1 to 6 of Article **44**;

d) that Table 15-2 of Appendix **15** identifies the bands 1530-1544 MHz (space-to-Earth) and 1626.5-1645.5 MHz (Earth-to-space) for distress and safety purposes in the maritime mobile-satellite service as well as for routine non-safety purposes,

resolves

1 that, in frequency coordination of MSS in the bands 1525-1559 MHz and 1626.5-1660.5 MHz, administrations shall ensure that the spectrum needed for distress, urgency and safety communications of GMDSS, as elaborated in Articles **32** and **33**, in the bands where No. **5.353A** applies, and for AMS(R)S communications within priority categories 1 to 6 of Article **44** in the bands where No. **5.357A** applies, is accommodated;

2 that administrations shall ensure the use of the latest technical advances, in order to achieve the most flexible and practical use of the generic allocations;

3 that administrations shall ensure that MSS operators carrying non-safety-related traffic yield capacity, as and when necessary, to accommodate the spectrum requirements for distress, urgency and safety communication of GMDSS communications, as elaborated in Articles **32** and **33**, and for AMS(R)S communications within priority categories 1 to 6 of Article **44**; this could be achieved in advance through the coordination

process in *resolves* 1, and, when necessary, through other means if such means are identified as a result of studies in *invites ITU-R*,

invites ITU-R

to conduct, in time for consideration by WRC-11, the appropriate technical, operational and regulatory studies to ensure long-term spectrum availability for the aeronautical mobile-satellite (R) service (AMS(R)S) including:

i) to study, as a matter of urgency, the existing and future spectrum requirements of the aeronautical mobile-satellite (R) service;

ii) to assess whether the long-term requirements of the AMS(R)S can be met within the existing allocations with respect to No. 5.357A while retaining unchanged the generic allocation for the mobile-satellite service in the bands 1 525-1 559 MHz and 1 626.5-1 660.5 MHz, and without placing undue constraints on the existing systems operating in accordance with the Radio Regulations;

iii) to complete studies to determine the feasibility and practicality of technical or regulatory means, other than the coordination process referred to in resolves 1 or the means considered in Report ITU-R M.2073, in order to ensure adequate access to spectrum to accommodate the AMS(R)S requirements as referenced in resolves 3 above, while taking into account the latest technical advances in order to maximize spectral efficiency;

iv) if the assessment identified in invites ITU-R i) and ii) indicates that these requirements cannot be met, to study existing MSS allocations or possible new allocations only for satisfying the requirements of the aeronautical mobile satellite (R) service for communications with priority categories 1 to 6 of Article 44, for global and seamless operation of civil aviation taking into account the need to avoid undue constraints on existing systems and other services,

invites WRC-11

to consider the results of the above ITU-R studies and to take appropriate action on this subject, while retaining unchanged the generic allocation to the mobile-satellite service in the bands 1525-1559 MHz and 1626.5-1660.5 MHz,

invites

the International Civil Aviation Organization (ICAO), the International Maritime Organization (IMO), the International Air Transport Association (IATA), administrations and other organizations concerned to participate in the studies identified in *invites ITU-R* above.

RESOLUTION 231 (WRC-07)

Additional allocations to the mobile-satellite service with particular focus on the bands between 4 GHz and 16 GHz

The World Radiocommunication Conference (Geneva, 2007),

considering

a) that ITU has studied the spectrum requirements for the satellite component of IMT for the period 2010-2020, and the results are contained in Report ITU-R M.2077;

b) that the results in Report ITU-R M.2077 indicate a shortfall of spectrum available for the satellite component of IMT in the Earth-to-space direction of between 19 and 90 MHz for the year 2020;

c) that the results in Report ITU-R M.2077 indicate a shortfall of spectrum available for the satellite component of IMT in the space-to-Earth direction of between 144 and 257 MHz for the year 2020;

d) that MSS systems which are not part of the satellite component of IMT may also require additional spectrum,

resolves to invite ITU-R

to complete, for WRC-11, studies of possible bands for new allocations to the mobile-satellite service in the Earth-to-space and space-to-Earth directions, with particular focus on the range 4 GHz to 16 GHz, taking into account sharing and compatibility, without placing undue constraints on existing services in this band,

invites administrations

to participate in the studies by submitting contributions to ITU-R.

RESOLUTION 351 (Rev.WRC-07)

Review of the frequency and channel arrangements in the HF bands allocated to the maritime mobile service contained in Appendix 17 with a view to improving efficiency through the use of new digital technology by the maritime mobile service

The World Radiocommunication Conference (Geneva, 2007),

considering

a) that the introduction of new digital technology in the maritime mobile service (MMS) shall not disrupt the distress and safety communications in the HF bands including those established by the International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended;

b) that changes made in Appendix **17** should not prejudice the future use of these frequencies or the capabilities of systems or new applications required for use by the MMS;

c) that the need to use new digital technologies in the MMS is growing rapidly;

d) that the use of new digital technology on HF frequencies allocated to the MMS will make it possible to better respond to the emerging demand for new services;

e) that the HF bands allocated to the MMS for A1A Morse telegraphy and narrow-band direct-printing (NBDP) contained in Appendix **17** are significantly under-utilized at present;

f) that there are new HF data exchange technologies capable of delivering maritime safety information;

g) that the International Maritime Organization (IMO) supports the frequencies of Appendix **15**, concerning NBDP, being retained for the foreseeable future;

h) that the ITU Radiocommunication Sector is conducting ongoing studies to improve the efficient use of these bands,

noting

a) that different digital technologies have already been developed and are in use in the HF bands in several radiocommunication services;

b) that new maritime HF data transfer protocols have already been developed and are in operation using Appendix **17** frequencies and other frequencies outside Appendix **17**,

resolves

to invite WRC-11 to consider necessary changes to Appendix **17** in order to implement the use of new technology by MMS, in accordance with *invites ITU-R*,

invites ITU-R

to finalize studies currently ongoing:

– to identify any necessary modifications to the frequency table contained within Appendix **17**;

– to identify any necessary transition arrangements for the introduction of new digital technologies and any consequential changes to Appendix **17**;

– to recommend how digital technologies can be introduced while ensuring compliance with distress and safety requirements,

encourages Member States

when contributing to the implementation of this Resolution, to take into consideration other modifications to Articles and Appendices as necessary,

instructs the Secretary-General

to bring this Resolution to the attention of IMO, the International Civil Aviation Organization (ICAO), the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA), the Comité International Radio-Maritime (CIRM), and International Electrotechnical Commission (IEC).

RESOLUTION 357 (WRC-07)

Consideration of regulatory provisions and spectrum allocations for use by enhanced maritime safety systems for ships and ports

The World Radiocommunication Conference (Geneva, 2007),

considering

a) that there is increasing need, on a global basis, to enhance ship and cargo identification, tracking, and surveillance as well as ship and port security and safety;

b) that the International Maritime Organization (IMO) adoption of the International Ship and Port Facility Security (ISPS) Code, specifically Safety of Life at Sea (SOLAS) Convention, Chapter XI-2, on special measures to enhance maritime security, requires long-range spectrum dependent systems;

c) that the introduction of the shipborne universal automatic identification system (AIS) supports maritime safety and offers potential enhancements to ship and port security and maritime safety;

d) that studies within ITU-R indicate that additional AIS channels in the mobile-satellite service may be required to enhance and accommodate global ship tracking capabilities;

e) that advanced maritime HF data systems may be used to deliver security alerts and safety information to, and to receive similar information and long-range identification and tracking (LRIT) information from, ships in global regions not under satellite coverage;

f) that use of existing maritime mobile allocations, where practicable, for ship and port security and enhanced maritime safety would be preferable, particularly where international interoperability is required;

g) that additional studies within ITU-R on spectrum efficient radio technologies may be required to resolve these multifaceted spectrum requirements;

h) that requirements for ITU Service Publications and specific revisions of content, format and structure of those publications may be required to support maritime security and safety systems,

noting

a) Resolution **342 (Rev.WRC-2000)**: "New technologies to provide improved efficiency in the use of the band 156-174 MHz by stations in the maritime mobile service";

b) Resolution **351 (Rev.WRC-07)**: "Review of the frequency and channel arrangements in the HF bands allocated to the maritime mobile service contained in Appendix **17** with a view to improving efficiency through the use of new digital technology by the maritime mobile service",

recognizing

a) that there is a global requirement to enhance maritime safety, ship and port security via spectrum dependent systems;

b) that existing and future technologies for Ship Security and Alerting Systems (SSAS), introduced as a result of the ISPS Code referred to in *considering b)*, will require long-range communication links and networks between mobile ships and shore-based stations;

c) that due to the importance of these radio links in ensuring the safe and secure operation of international shipping and commerce, they must be resilient to interference;

d) that studies will be required to provide a basis for considering regulatory changes, including additional allocations and recommendations, designed to accommodate spectrum requirements of ship and port security, consistent with the protection of incumbent services;

e) that the ITU and international standards organizations have initiated related studies on spectrum efficient technology,

resolves

1 that WRC-11 consider amendments to provisions of the Radio Regulations necessary to provide for the operation of ship and port security and maritime safety systems;

2 that WRC-11 consider additional allocations to the maritime mobile service below 1 GHz to support the requirements identified in *resolves* 1;

3 that WRC-11 consider additional allocations to the maritime mobile-satellite service in frequency bands allocated to the maritime mobile service between 156 and 162.025 MHz to support the requirements identified in *resolves* 1,

invites ITU-R

1 to conduct, as a matter of urgency, studies to determine the spectrum requirements and potential frequency bands suitable to support ship and port security and enhanced maritime safety systems;

2 that the studies referred to in *invites ITU-R* 1 should include the applicability of spectrum efficient technologies, and sharing and compatibility studies with services already having allocations in potential spectrum for ship safety and port security systems,

invites

all members of the Radiocommunication Sector, the International Maritime Organization (IMO), International Organization for Standardization (ISO), International Electrotechnical Commission (IEC), and the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) to contribute to these studies,

instructs the Secretary-General

to bring this Resolution to the attention of IMO, ISO, IEC, IALA and other international and regional organizations concerned.

RESOLUTION 413 (Rev.WRC-07)

Use of the band 108-117.975 MHz by the aeronautical mobile (R) service

The World Radiocommunication Conference (Geneva, 2007),

considering

a) the current allocation of the frequency band 108-117.975 MHz to the aeronautical radionavigation service (ARNS);

b) the current requirements of FM broadcasting systems operating in the frequency band 87-108 MHz;

c) that digital sound broadcasting systems are capable of operating in the frequency band at about 87-108 MHz as described in Recommendation ITU-R BS.1114;

d) the need for the aeronautical community to provide additional services by enhancing navigation systems through a radiocommunication data link;

e) the need for the broadcasting community to provide digital terrestrial sound broadcasting services;

f) that this allocation was made by this Conference in the knowledge that studies are ongoing with respect to the technical characteristics, sharing criteria and sharing capabilities;

g) the need for the aeronautical community to provide additional services for radiocommunications, relating to safety and regularity of flight, in the band 112-117.975 MHz;

h) that this Conference has modified the allocation of the band 112-117.975 MHz to the aeronautical mobile (R) services (AM(R)S) in order to make available this frequency band for new AM(R)S systems, and in doing so enabled further technical developments, investments and deployment;

i) that the frequency band 117.975-137 MHz currently allocated to the AM(R)S is reaching saturation in certain areas of the world;

j) that this new allocation is intended to support the introduction of applications and concepts in air traffic management which are data intensive, and which could support data links that carry safety-critical aeronautical data;

k) that additional information is needed about the new technologies which will be used, the amount of spectrum required, the characteristics and sharing capabilities/conditions, and that therefore studies are urgently required on which AM(R)S systems will be used, the amount of spectrum required, the characteristics and the conditions for sharing with ARNS systems,

recognizing

a) that precedence must be given to the ARNS operating in the frequency band 108-117.975 MHz;

b) that, in accordance with Annex 10 of the Convention of the International Civil Aviation Organization (ICAO) on international civil aviation, all aeronautical systems must meet standards and recommended practices (SARPs) requirements;

c) that within ITU-R, compatibility criteria between FM broadcasting systems operating in the frequency band 87-108 MHz and the ARNS operating in the frequency band 108-117.975 MHz already exist, as indicated in the most recent version of Recommendation ITU-R SM.1009;

d) that all compatibility issues between FM broadcasting systems and ICAO standard ground-based systems for the transmission of radionavigation-satellite differential correction signals have been addressed,

noting

a) that aeronautical systems are converging towards a radiocommunication data link environment to support aeronautical navigation and surveillance functions, which need to be accommodated in existing radio spectrum;

b) that some administrations are planning to introduce digital sound broadcasting systems in the frequency band at about 87-108 MHz;

c) that no compatibility criteria currently exist between FM broadcasting systems operating in the frequency band 87-108 MHz and the planned additional aeronautical systems in the adjacent band 108-117.975 MHz using aircraft transmission;

d) that no compatibility criteria currently exist between digital sound broadcasting systems capable of operating in the frequency band at about 87-108 MHz and aeronautical services in the band 108-117.975 MHz,

resolves

1 that any aeronautical mobile (R) service systems operating in the band 108-117.975 MHz shall not cause harmful interference to, nor claim protection from ARNS systems operating in accordance with international aeronautical standards;

2 that any AM(R)S systems planned to operate in the frequency band 108-117.975 MHz shall, as a minimum, meet the FM broadcasting immunity requirements contained in Annex 10 of the ICAO Convention on International Civil Aviation for existing aeronautical radionavigation systems operating in this frequency band;

3 that AM(R)S systems operating in the band 108-117.975 MHz shall place no additional constraints on the broadcasting service or cause harmful interference to stations operating in the bands allocated to the broadcasting service in the frequency band 87-108 MHz and No. **5.43** does not apply to systems identified in *recognizing d)*;

4 that frequencies below 112 MHz shall not be used for AM(R)S systems excluding the ICAO systems identified in *recognizing d)*;

5 that any AM(R)S operating in the frequency band 108-117.975 MHz shall meet SARPs requirements published in Annex 10 of the ICAO Convention on International Civil Aviation;

6 that WRC-11 should consider, based on the results of the ITU-R studies mentioned under *invites ITU-R,* any further regulatory measure to facilitate introduction of new AM(R)S systems,

invites ITU-R

1 to study any compatibility issues between the broadcasting and AM(R) services that may arise from the introduction of AM(R)S systems in the band 112-117.975 MHz, and to develop new or revised ITU-R Recommendations as appropriate;

2 to study any compatibility issues between the broadcasting and AM(R) services in the band 108-117.975 MHz that may arise from the introduction of appropriate digital sound broadcasting systems, described in Recommendation ITU-R BS.1114, and to develop new or revised ITU-R Recommendations as appropriate;

3 to report to WRC-11 on the results of these studies,

instructs the Secretary-General

to bring this Resolution to the attention of ICAO.

RESOLUTION 417 (WRC-07)

Use of the band 960-1 164 MHz by the aeronautical mobile (R) service

The World Radiocommunication Conference (Geneva, 2007),

considering

a) that this Conference has allocated the band 960 to 1 164 MHz to the aeronautical mobile (R) service (AM(R)S) in order to make available this frequency band for new AM(R)S systems, and in doing so enabled further technical developments, investments and deployment;

b) the current allocation of the frequency band 960-1 164 MHz to the aeronautical radionavigation service (ARNS);

c) the use of the band 960-1 215 MHz by the ARNS is reserved on a worldwide basis for the operation and development of airborne electronic aids to air navigation and any directly associated ground-based facilities per No. **5.328**;

d) that new technologies are being developed to support communications and air navigation, including airborne and ground surveillance applications;

e) that this new allocation is intended to support the introduction of applications and concepts in air traffic management which are data intensive and which could support data links that carry safety critical aeronautical data;

f) that in countries listed in No. **5.312** the frequency band 960-1 164 MHz is also used by systems in the ARNS for which standards and recommended practices (SARPs) have not been developed nor published by the International Civil Aviation Organization (ICAO);

g) that, furthermore, the frequency band 960-1 164 MHz is also used by a non-ICAO system operating in the ARNS that has characteristics similar to those of ICAO standard distance measuring equipment;

h) that this allocation was made knowing that studies are ongoing with respect to the technical characteristics, sharing criteria and sharing capabilities;

i) that the frequency band 117.975-137 MHz currently allocated to the AM(R)S is reaching saturation within certain areas of the world, therefore that band would not be available to support additional medium- and long-range data communications;

j) that, additional information is needed on the new technologies which will be used, other than the AM(R)S system identified in *recognizing c)*, the amount of spectrum required, and the characteristics and sharing capabilities/conditions. Therefore, studies are urgently required on which AM(R)S systems will be used, the amount of spectrum required and the characteristics and conditions for sharing with ARNS systems,

recognizing

a) that precedence must be given to the ARNS operating in the frequency band 960-1 164 MHz;

b) that Annex 10 of the Convention of the ICAO contains SARPs for aeronautical radionavigation and radiocommunication systems used by international civil aviation;

c) that all compatibility issues between the ICAO Standard Universal Access Transceiver (UAT) and other systems which operate in the same frequency range, excluding the system identified in *considering f),* have been addressed;

d) that in the frequency band 1 024-1 164 MHz the sharing conditions are more complex than in the band 960-1 024 MHz,

noting

that, excluding the system identified in *recognizing c)*, no compatibility criteria currently exist between AM(R)S systems proposed for operations in the frequency band 960-1 164 MHz and the existing aeronautical systems in the band,

resolves

1 that any AM(R)S system operating in the frequency band 960-1 164 MHz shall meet SARPs requirements published in Annex 10 of the ICAO Convention on International Civil Aviation;

2 that any AM(R)S systems operating in the band 960-1 164 MHz shall not cause harmful interference to, nor claim protection from, and shall not impose constraints on the operation and planned development of aeronautical radionavigation systems in the same band;

3 that compatibility studies between AM(R)S systems operating in the band 960-1 164 MHz and ARNS systems in *considering f)* and *g)* need to be conducted to develop sharing conditions to ensure that the conditions of *resolves* 2 are satisfied, and that ITU-R Recommendations are developed as appropriate;

4 that the result of the studies pursuant to *resolves* 3 shall be reported to WRC-11 and the decision should be taken by WRC-11 to review, if appropriate, regulatory provisions in *resolves* 2 taking into account protection requirements of ARNS systems identified in *considering f)* and *g)* and the need for global facilitation of AM(R)S operating in accordance with ICAO standards;

5 that frequencies in the band 960-1 164 MHz shall not be used by an AM(R)S system, except for the AM(R)S system identified in *recognizing c)*, until all potential compatibility issues with the ARNS and, as necessary, the radionavigation-satellite service (RNSS) in the adjacent band have been resolved, also taking into account *recognizing d)*,

invites

administrations and ICAO, for the purposes of conducting the ITU-R studies mentioned in *resolves* 3 and 5, to provide to ITU-R the technical and operational characteristics of systems involved,

invites ITU-R

1 to conduct studies in accordance with *resolves* 3 and 5 on operational and technical means to facilitate sharing between AM(R)S

systems operating in the band 960-1 164 MHz and ARNS systems identified in *considering f)* and *g)*;

2 to conduct studies in accordance with *resolves* 5 on operational and technical means to facilitate sharing between AM(R)S systems operating in the band 960-1 164 MHz and the RNSS operating in the band 1 164-1 215 MHz;

3 to report the results of the studies to WRC-11,

instructs the Secretary-General

to bring this Resolution to the attention of ICAO.

RESOLUTION 420 (WRC-07)

Consideration of the frequency bands between 5 000 and 5 030 MHz for aeronautical mobile (R) service surface applications at airports

The World Radiocommunication Conference (Geneva, 2007),

considering

a) the current allocation of the frequency band 5 000-5 010 MHz to the aeronautical mobile-satellite (R) service (AMS(R)S), subject to agreement obtained under No. **9.21**, the aeronautical radionavigation service (ARNS) and the radionavigation-satellite service (RNSS) (Earth-to-space);

b) the current allocation of the frequency band 5 010-5 030 MHz to AMS(R)S, subject to agreement obtained under No. **9.21**, ARNS and RNSS (space-to-Earth and space-to-space);

c) the current allocation of the frequency band 4 990-5 000 MHz to the radio astronomy service;

d) that this Conference has additionally allocated the band 5 091-5 150 MHz to the aeronautical mobile (R) service (AM(R)S), for use by systems operating in accordance with international aeronautical standards, limited to surface applications at airports;

e) that the International Civil Aviation Organization (ICAO) is in the process of identifying the technical and operating characteristics of such AM(R)S systems, and that initial estimates for associated spectrum requirements are approximately 60-100 MHz in some portion of the band 5 000-5 150 MHz (Report ITU-R M.2120);

f) that the band 5 091-5 150 MHz may not provide sufficient spectrum capacity to satisfy the requirement identified in *considering e)*, and therefore additional spectrum may be required;

g) that the protection requirements for the radio astronomy service are given in Recommendation ITU-R RA.769,

recognizing

a) that the RNSS allocations in these bands were made at WRC-2000;

b) that RNSS currently operates in the Earth-to-space direction in the band 5 000-5 010 MHz, and needs access to the space-to-Earth allocation in 5 010-5 030 MHz for service and feeder links in the longer term;

c) that RNSS and AM(R)S systems planned in the 5 GHz range are still evolving, and that technical characteristics and operational parameters for these systems have not been fully established within ITU-R;

d) that protection of RNSS and the radio astronomy service must first be demonstrated before additional services can be allocated in the bands between 5 000-5 030 MHz;

e) that, currently, there are no agreed studies within ITU-R for AM(R)S to ensure protection of RNSS and the radio astronomy service,

resolves

1 that ITU-R investigate, with priority, AM(R)S spectrum requirements for surface applications in the 5 GHz range, in order to determine if they can be fulfilled in the band 5 091-5 150 MHz;

2 that ITU-R further investigate, if necessary, the feasibility of an allocation for AM(R)S for surface applications at airports, study the technical and operational issues relating to the protection of RNSS in the bands between 5 000 and 5 030 MHz and of the radio astronomy service in the band 4 990-5 000 MHz from AM(R)S, and develop appropriate Recommendations;

3 that WRC-11 consider results of the above studies and take appropriate actions,

invites

1 administrations and ICAO to supply technical and operational characteristics for AM(R)S necessary for compatibility studies, and to participate actively in the studies;

2 administrations to supply technical and operational characteristics and protection criteria for RNSS necessary for compatibility studies, and to participate actively in the studies,

instructs the Secretary-General

to bring this Resolution to the attention of ICAO.

RESOLUTION 421 (WRC-07)

Consideration of appropriate regulatory provisions for the operation of unmanned aircraft systems

The World Radiocommunication Conference (Geneva, 2007),

considering

a) that worldwide use of unmanned aircraft systems (UAS) is expected to increase significantly in the near future;

b) that unmanned aircraft need to operate seamlessly with piloted aircraft in non-segregated airspaces and that there is a need to provide globally harmonized spectrum for that purpose;

c) that the safe flight operation of UAS needs reliable communication links and associated spectrum, especially for the remote pilot to command and control the flight and to relay the air traffic control communications;

d) that the safe flight operation of UAS necessitates advanced techniques to detect and track nearby aircraft, terrain and obstacles to navigation in order to ensure the UAS avoids these objects in a manner equivalent to that achieved by manned aircraft;

e) that satellite radiocommunications are part of UAS operations, in particular to relay transmissions beyond the horizon and maintain safety of flight;

f) that there is a need to protect existing services;

g) that some applications of UAS involve high data-rate payload transmissions from the aircraft to remote stations,

recognizing

a) that UAS will operate in the same environment as manned aircraft;

b) that some UAS will operate below or above the current conventional air traffic of manned aircraft, including in specific

environments not accessible to manned aircraft, such as volcanoes, hurricanes, poisonous or electromagnetic zones;

c) that studies are required to provide a basis for considering regulatory changes, including additional allocations, to accommodate spectrum requirements of UAS consistent with the protection of incumbent services;

d) that any new allocation should not place undue constraints on services to which the frequency bands are allocated;

e) that this agenda item is not intended to be used to identify bands for UAS use, but rather only to propose, as necessary, new allocations or modifications to existing allocations to accommodate UAS,

resolves

that WRC-11 consider, based on the results of ITU-R studies:

1 the spectrum requirements and possible regulatory actions, including additional allocations, to support the remote pilot in commanding and controlling the unmanned aircraft systems and in relaying the air traffic control communications, as mentioned in *considering c)*;

2 the spectrum requirements and possible regulatory actions, including additional allocations, to support the safe operation of unmanned aircraft systems not covered by *resolves* 1, as mentioned in *considering d)*,

invites ITU-R

1 to conduct in time for WRC-11 the necessary studies leading to technical, regulatory and operational recommendations to the Conference, enabling that Conference to decide on appropriate allocations for the operation of UAS;

2 that the studies referred to in *invites ITU-R* 1 should include sharing and compatibility studies with services already having allocations in those bands;

3 to produce a report or a recommendation, as appropriate, on how to accommodate the radiocommunication requirements for UAS payloads,

further invites

the International Civil Aviation Organization (ICAO), the International Air Transport Association (IATA), administrations and other organizations concerned to participate in the studies identified in *invites ITU-R* above,

requests the Secretary-General

to bring this Resolution to the attention of ICAO.

RESOLUTION 551 (WRC-07)

Use of the band 21.4-22 GHz for broadcasting-satellite service and associated feeder-link bands in Regions 1 and 3

The World Radiocommunication Conference (Geneva, 2007),

considering

a) that WARC-92 allocated the band 21.4-22.0 GHz in Regions 1 and 3 to the broadcasting-satellite service and the allocation came into effect on 1 April 2007;

b) that after 1 April 2007 the introduction of BSS (HDTV) systems in this band should be regulated in a flexible and equitable manner until such time as a future competent world radiocommunication conference has adopted definitive provisions for this purpose in accordance with Resolution **507 (Rev.WRC-03)**;

c) that the interim use of this band by the broadcasting-satellite service is subject to the provisions of Resolution **525 (Rev.WRC-07)**;

d) that future BSS systems in the band 21.4-22.0 GHz may provide extremely high resolution imagery (EHRI) applications as shown in Recommendation ITU-R BT.1201 and Report ITU-R BT.2042;

e) that, based on its studies, ITU-R has established basic operating parameters of BSS systems in this band, including methods of overcoming attenuation in countries with higher rainfall (Recommendation ITU-R BO.1659 and Report ITU-R BO.2071);

f) that in the band 21.4-22.0 GHz in Regions 1 and 3, reference power flux-density for the BSS has been developed and given in Recommendation ITU-R BO.1776;

g) that in the band 21.4-22.0 GHz in Regions 1 and 3, intra-service sharing criteria for GSO BSS systems have been developed and given in Recommendation ITU-R BO.1785;

h) that *a priori* planning is not necessary and should be avoided as it freezes access according to technological assumptions at the time of

planning and then prevents flexible use taking account of real world demand and technical developments;

i) that interim arrangements for the use of the bands are on a first-come-first-served basis;

j) that further study is needed for the spectrum usage of the band 21.4-22.0 GHz in Regions 1 and 3,

noting

that Resolution **525 (Rev.WRC-07)** identifies interim procedures for introduction of HDTV BSS systems in the band 21.4-22 GHz in Regions 1 and 3,

resolves

1 that ITU-R continue technical and regulatory studies on harmonization of spectrum usage, including planning methodologies, coordination procedures or other procedures, and BSS technologies, in preparation for WRC-11, in the 21.4-22 GHz band and the associated feeder-link bands in Regions 1 and 3, taking into account *considering h)* and *i)*;

2 that WRC-11 review the results of the studies and decide the usage of the 21.4-22 GHz band and the associated feeder-link bands in Regions 1 and 3,

invites administrations

to participate in ITU-R studies by providing contributions.

RESOLUTION 611 (WRC-07)

Use of portion of the VHF band by the radiolocation service

The World Radiocommunication Conference (Geneva, 2007),

considering

a) that the band below 300 MHz is primarily allocated to terrestrial services;

b) that the radiolocation service has no global primary allocations in the band 30-300 MHz;

c) that the frequency band 138-144 MHz is allocated to the radiolocation service on a primary basis in Region 2, the frequency band 216-225 MHz is allocated to radiolocation service on a secondary basis in Region 2, and the frequency band 223-230 MHz is also allocated to radiolocation service on a secondary basis in Region 3;

d) the current regional allocations to radiolocation service are used on the shared basis with other services, specifically with fixed and mobile services;

e) that due to extensive development of broadcasting service in the frequency bands 174-230 MHz and 470-862 MHz there is an increasing need to accommodate the existing radiolocation service operating in these bands to different frequency bands, while improving the interference mitigation techniques and introducing modern technologies;

f) that there are emerging requirements for increased resolution and range for radars operation;

g) that VHF radiowaves propagate well through the ionosphere, thus enabling various space object detection applications including remote space sensing and asteroid detection, as well as for defining the position of natural and artificial Earth satellites, from terrestrial-based radiolocation systems;

h) that Recommendation ITU-R M.1372 identifies interference reduction techniques which enhance compatibility among radar systems;

i) that over the horizon operation of radiolocation in VHF frequency range is technically not feasible;

j) that current requirements for radiolocation systems for space-object detection from terrestrial locations in portion of the band 30-300 MHz are based on 2 MHz bandwidth systems, however allocation with a wider frequency range may provide flexibility and facilitate sharing with existing services;

k) that, to provide adequate spectrum for new radar systems, there is a need to allocate on a primary basis worldwide additional spectrum in the 30-300 MHz frequency range,

recognizing

a) that it is important to ensure radiolocation radars can be operated compatibly with the existing primary services having allocations in the portions of the VHF band;

b) that ITU-R initiated studies in response to Question ITU-R 237/8 on characteristics and protection criteria for radars operating in the radiolocation service in the frequency band 30-300 MHz,

resolves

1 to consider at WRC-11 a primary allocation to the radiolocation service in the portion of the band 30-300 MHz for the implementation of new applications in the radiolocation service, with bandwidth no larger than 2 MHz, taking into account the results of ITU-R studies;

2 that the introduction of new systems in the radiolocation service shall be avoided in the frequency bands 156.4875-156.8375 MHz and 161.9625-162.0375 MHz, which are used by distress and safety applications in the maritime mobile service,

invites ITU-R

1 to continue to study, as a matter of urgency, the technical characteristics, protection criteria, and other factors to ensure that radiolocation systems can operate compatibly with systems operating in

accordance with the Table in service in the 30-300 MHz frequency range band;

2 to include the results of the above studies in one or more new or existing ITU-R Recommendations, if appropriate;

3 to complete these studies in time for WRC-11.

RESOLUTION 612 (WRC-07)

Use of the radiolocation service between 3 and 50 MHz to support high-frequency oceanographic radar operations

The World Radiocommunication Conference (Geneva, 2007),

considering

a) that there is increasing interest, on a global basis, in the operation of high-frequency oceanographic radars for measurement of coastal sea surface conditions to support environmental, oceanographic, meteorological, climatological, maritime and disaster mitigation operations;

b) that high-frequency oceanographic radars are also known in parts of the world as HF ocean radars, HF wave height sensing radars or HF surface wave radars;

c) that high-frequency oceanographic radars operate through the use of ground-wave propagation;

d) that high-frequency oceanographic radar technology has applications in global maritime domain awareness by allowing the long-range sensing of surface vessels, which provides a benefit to the global safety and security of shipping and ports;

e) that operation of high-frequency oceanographic radars provides benefits to society through environmental protection, disaster preparedness, public health protection, improved meteorological operations, increased coastal and maritime safety and enhancement of national economies;

f) that high-frequency oceanographic radars have been operated on an experimental basis around the world, providing an understanding of spectrum needs and spectrum sharing considerations, as well as an understanding of the benefits these systems provide;

g) that between 3 and 50 MHz, no radiolocation allocations exist;

h) that performance and data requirements dictate the regions of spectrum that can be used by high-frequency oceanographic radar systems for ocean observations,

recognizing

a) that high-frequency oceanographic radars have been operated on an experimental basis for more than 30 years;

b) that developers of the experimental systems have implemented techniques to make the most efficient use of the spectrum and mitigate interference to other radio services;

c) that the objective of Question ITU-R 240/8 is to study the most appropriate frequency bands for operation of high-frequency oceanographic radars considering both radar system requirements and the protection of existing services;

d) that high-frequency oceanographic radars operate with peak power levels on the order of 50 W,

resolves

1 to invite ITU-R to identify high-frequency oceanographic radar system applications between 3 and 50 MHz, including bandwidth requirements, appropriate portions of this band for these applications, and other characteristics necessary to conduct sharing studies;

2 to invite ITU-R to conduct sharing analyses between the radiolocation service applications identified under *resolves* 1 and incumbent services in the bands identified to be suitable for the operation of high-frequency oceanographic radar systems;

3 that, if compatibility with existing services is confirmed under *resolves* 2, to recommend that WRC-11 consider allocations to the radiolocation service in several suitable bands between 3 and 50 MHz, as determined in the ITU-R studies, each band not exceeding 600 kHz, for the operation of oceanographic radars,

invites administrations

to contribute to the sharing studies between the radiolocation service and incumbent services in portions of the 3 to 50 MHz band identified as suitable for high-frequency oceanographic radar operations,

invites ITU-R

to complete the necessary studies, as a matter of urgency, taking into account the present use of the allocated band, with a view to presenting, at the appropriate time, the technical information likely to be required as a basis for the work of WRC-11,

instructs the Secretary-General

to bring this Resolution to the attention of the International Maritime Organization (IMO), World Meteorological Organization (WMO) and other international and regional organizations concerned.

RESOLUTION 613 (WRC-07)

Global primary allocation to the radiodetermination-satellite service in the frequency band 2 483.5-2 500 MHz (space-to-Earth)

The World Radiocommunication Conference (Geneva, 2007),

considering

a) that determination of position and time using satellite systems offers great societal benefits by, for example, enabling efficiencies in transport utilization, banking and location-based services;

b) that the accuracy of positions and timing determined by means of transmissions from space subject to ionospheric delays can be improved using multiple frequencies;

c) that the band 2 483.5-2 500 MHz is allocated worldwide to the fixed, mobile and mobile-satellite services (space-to-Earth) on a primary basis;

d) that the band 2 400-2 500 MHz is also designated for industrial, scientific and medical (ISM) applications. Radiocommunication services operating within this band must accept harmful interference which may be caused by these applications. ISM equipment operating in these bands is subject to the provisions of No. **15.13**;

e) that the band 2 483.5-2 500 MHz is also allocated to radiolocation on a primary basis in Regions 2 and 3 and on a secondary basis in Region 1;

f) that the band 2 483.5-2 500 MHz is already allocated to the radiodetermination-satellite service on a primary basis in Region 2 and on a secondary basis in Region 3, and that in addition No. **5.371** specifies a secondary allocation in Region 1 and No. **5.400** a primary allocation in 22 countries of Regions 1 and 3;

g) that systems in the radiodetermination-satellite service (RDSS) already use the band 2 483.5-2 500 MHz (space-to-Earth) in parts of Region 3 to provide position and timing determination;

h) that in Europe a radionavigation-satellite system is under development that intends to use the band 2 483.5-2 500 MHz in response to the growing need of public end users for positioning and timing applications,

recognizing

a) that mobile satellite systems using the 2 483.5-2 500 MHz band provide telecommunication services in many remote areas;

b) that other bands are available for radiodetermination- and radionavigation-satellite services,

noting

that the proposed allocation is not intended to prevent the development of other services in the same frequency band but for this to be done in a regulated manner. ITU-R may need to develop the appropriate sharing criteria, taking into account other in-band services,

resolves to invite ITU-R

to conduct, and complete in time for WRC-11, the appropriate technical, operational and regulatory studies leading to technical and procedural recommendations to the Conference enabling it to decide whether a global primary allocation for the radiodetermination-satellite service in the frequency band 2 483.5-2 500 MHz (space-to-Earth) is compatible with other services in the band,

invites administrations

to participate in the studies by submitting contributions to ITU-R.

RESOLUTION 614 (WRC-07)

Use of the band 15.4-15.7 GHz by the radiolocation service

The World Radiocommunication Conference (Geneva, 2007),

considering

a) that the aeronautical radionavigation service (ARNS) has an allocation on a primary basis in the frequency range 15.4-15.7 GHz;

b) that the radionavigation service is a safety service used permanently or temporarily for the safeguarding of human life (No. **1.59**);

c) that in accordance with No. **4.10** Member States are to recognize that the safety aspects of radionavigation and other safety services require special measures to ensure their freedom from harmful interference; it is necessary therefore to take this factor into account in the assignment and use of frequencies;

d) that the mobile aspect of the aeronautical radionavigation service may require the stations of this service to be used in unspecified points;

e) that the fixed-satellite service has an allocation on a primary basis in the frequency range 15.43-15.63 GHz taking into account the constraints of No. **5.511A**, as well as the bands 15.4-15.43 and 15.63-15.7 GHz taking into account constraints of No. **5.511D**;

f) that there are no ICAO-standard ARNS systems operating in this band and that those ARNS systems that do use this band are radars that have similar technical and operational characteristics as radiolocation systems;

g) that, to provide adequate spectrum for new radar systems, there is a need to allocate on a primary basis worldwide additional spectrum in the band 15.4-15.7 GHz for the radiolocation service;

h) that emerging requirements for increased resolution and range accuracy necessitate wider emission bandwidths;

i) that radiolocation services using system low duty cycle emissions, scanning beams and interference reduction have demonstrated compatible

operations with radionavigation radars in several bands (2 900-3 100 MHz, 9 000-9 200 MHz and 9 300-9 500 MHz) over many years;

j) that radars in the radiolocation service operate on a primary basis worldwide in the band 15.7-17.3 GHz;

k) that Recommendation ITU-R M.1372 identifies interference reduction techniques which enhance compatibility among radar systems;

l) that Report ITU-R M.2076 contains further mitigation factors for radiolocation interference to radionavigation radars in the 9 GHz band, many of which apply to the band 15.4-15.7 GHz;

m) that Recommendation ITU-R M.1730 provides information on the technical characteristics and protection criteria for the radiolocation service in the band 15.7-17.3 GHz,

recognizing

a) that it is important to ensure radiolocation radars can be operated compatibly with the existing primary services having allocations in the band 15.4-15.7 GHz and with the radio astronomy service (RAS) in the adjacent band 15.35-15.40 GHz;

b) that a primary allocation worldwide may be required to give developers of radar systems operating in the radiolocation service, manufacturers and investors confidence that their systems will have the regulatory assurance to operate globally;

c) that the safety aspects of the radionavigation service in No. **1.59** require special measures to ensure the freedom of harmful interference in accordance with No. **4.10**,

resolves

to consider at WRC-11 a primary allocation to the radiolocation service in the band 15.4-15.7 GHz, taking into account the results of ITU-R studies,

invites ITU-R

1 to study, as a matter of urgency, the technical characteristics, protection criteria, and other factors to ensure that radiolocation systems can operate compatibly with systems in the aeronautical radionavigation and fixed-satellite services in the band 15.4-15.7 GHz, taking account of the safety nature of the aeronautical radionavigation service;

2 to study, as a matter of urgency, the compatibility between the radiolocation service in the band 15.4-15.7 GHz and RAS in the adjacent band 15.35-15.40 GHz;

3 to include the results of the above studies in one or more new or existing ITU-R Recommendations;

4 to complete these studies in time for WRC-11.

RESOLUTION 671 (WRC-07)

Recognition of systems in the meteorological aids service in the frequency range below 20 kHz

The World Radiocommunication Conference (Geneva, 2007),

considering

a) that lightning detection systems used by meteorological organizations are long-established, passive applications which have operational, safety-of-life considerations providing warnings of extreme weather events to a range of organizations and customers including emergency services, aviation, defence, the utilities and the public;

b) that although lightning strikes emit electromagnetic waves over a range of frequencies, the propagation characteristics below 20 kHz make the frequency range of about 9 kHz to 20 kHz the most suitable for detection;

c) that to avoid interference in certain parts of the world, the centre frequency of a current international network of lightning detection stations, which had been centred on 9.765625 kHz since 1939, has recently had to be moved to 13.733 kHz;

d) that other lightning detection systems often use a combination of UHF and LF frequencies, but these provide more limited coverage than systems operating at VLF frequencies;

e) that it is expected that between 30 and 40 reception stations would be needed at VLF frequencies to provide global coverage;

f) that these systems have coexisted with services already having allocations in potential spectrum for systems in the meteorological aid service for a considerable period of time without interference,

recognizing

a) that the accurate location of lightning is important to public safety. As well as the dangers of the lightning strike itself, thunderstorms can result

in intense precipitation with consequent flooding, severe icing, wind shear, turbulence and gusting winds;

b) that recent instances of interference have increased concerns that lightning detection systems may not be able to maintain the quality of service or to provide global coverage unless recognition is afforded to these systems in the Radio Regulations, and coordination with other services is carried out properly;

c) that this passive use is poorly protected at present;

d) that it is desirable to allocate frequencies to the meteorological aids service for lightning detection systems in spectrum which is not shared with high-power systems,

noting

a) that the 3 dB bandwidth of existing lightning detection systems is approximately 2.5 kHz and hence an allocation of between 3 and 5 kHz bandwidth would be required;

b) that the proposed allocation is not intended to prevent the development of other services in the same frequency band but for this to be done in a regulated manner. ITU-R may need to develop the appropriate sharing criteria, taking into account both in-band and adjacent band services,

resolves

1 to invite ITU-R to conduct, and complete in time for WRC-11, the required studies leading to technical and procedural recommendations to the Conference enabling it to decide on an appropriate method of providing recognition to long-established systems, including the possibility of making an allocation to the meteorological aids service in the frequency range below 20 kHz;

2 that the studies referred to in *resolves* 1, without placing constraints on existing services operating in accordance with the Radio Regulations, shall include sharing and compatibility studies with services already having allocations in potential spectrum for systems in the meteorological aids service taking into account the needs of other services,

invites administrations

to participate in the studies by submitting contributions to ITU-R.

RESOLUTION 672 (WRC-07)

Extension of the allocation to the meteorological-satellite service in the band 7 750-7 850 MHz

The World Radiocommunication Conference (Geneva, 2007),

considering

a) that the band 7 750-7 850 MHz is allocated to the fixed, the meteorological-satellite (space-to-Earth) and the mobile services;

b) that this band is currently used by non-geostationary polar orbiting meteorological satellites transmitting typically in data dump modes to large earth stations;

c) the maximum contact times between satellites and corresponding earth stations occur at high latitudes resulting in optimum deployment of such earth stations at high latitudes in the northern and the southern hemispheres;

d) that the bandwidth requirements for transmission of data from high-resolution sensors on the next-generation non-geostationary meteorological satellites planned to be launched in the time-frame 2017-2020 are in excess of 100 MHz;

e) that an extension of the current allocation by 50 MHz would be necessary to accommodate future data transmission requirements;

f) that the band 7 850-7 900 MHz is allocated to exactly the same services as the band 7 750-7 850 MHz and would be a prime candidate for extension of the current allocation to the meteorological-satellite service;

g) that ITU-R studies conducted prior to WRC-97 concluded that sharing between the meteorological-satellite service and the fixed service is possible with ample margins resulting to the allocation of the band 7 750-7 850 MHz,

recognizing

1 that the data obtained by these meteorological satellites are essential for global weather forecast, climate changes and hazard predictions;

2 that existing systems need to be duly protected,

resolves

1 to invite ITU-R to conduct sharing analyses between non-geostationary meteorological satellites operating in the space-to-Earth direction and the fixed and mobile services in the band 7 850-7 900 MHz with a view to extending the current allocation in the space-to-Earth direction to this band;

2 to recommend that WRC-11 review the results of the studies under *resolves* 1;

3 to make appropriate modifications to the Table of Frequency Allocations with respect to *resolves* 1, based on proposals from administrations,

invites administrations

to contribute to the sharing studies between the meteorological-satellite service and the fixed and mobile services in the frequency range 7 850-7 900 MHz,

invites ITU-R

to complete the necessary studies, taking into account the present use of allocated bands, with a view to presenting its results to WRC-11.

RESOLUTION 731 (WRC-2000)

Consideration by a future competent world radiocommunication conference of issues dealing with sharing and adjacent-band compatibility between passive and active services above 71 GHz

The World Radiocommunication Conference (Istanbul, 2000),

considering

a) that the changes made to the Table of Frequency Allocations by this Conference in bands above 71 GHz were based on the requirements known at the time of the Conference;

b) that the passive service spectrum requirements above 71 GHz are based on physical phenomena and therefore are well known, and are reflected in the changes made to the Table of Frequency Allocations by this Conference;

c) that several bands above 71 GHz are already used by Earth exploration-satellite service (passive) and space research service (passive) because they are unique bands for the measurement of specific atmospheric parameters;

d) that there is currently only limited knowledge of requirements and implementation plans for the active services that will operate in bands above 71 GHz;

e) that, in the past, technological developments have led to viable communication systems operating at increasingly higher frequencies, and that this can be expected to continue so as to make communication technology available in the future in the frequency bands above 71 GHz;

f) that, in the future, alternative spectrum needs for the active and passive services should be accommodated when the new technologies become available;

g) that, following the revisions to the Table of Frequency Allocations by this Conference, sharing studies may be required for services in some bands above 71 GHz;

h) that interference criteria for passive sensors have been developed and are given in Recommendation ITU-R RS.1029;

i) that protection criteria for radio astronomy have been developed and are given in Recommendation ITU-R RA.769;

j) that several satellite downlink allocations have been made in bands adjacent to those allocated to the radio astronomy service;

k) that, sharing criteria for active and passive services in bands above 71 GHz have not yet been fully developed within ITU-R;

l) that, in order to ensure protection of passive services above 71 GHz, this Conference avoided making allocations to both active and passive services in some bands such as 100-102 GHz, 148.5-151.5 GHz and 226-231.5 GHz, so as to prevent potential sharing problems,

recognizing

that, to the extent practicable, the burden of sharing among active and passive services should be equitably distributed among the services to which allocations are made,

resolves

that a future competent conference should consider the results of ITU-R studies with a view to revising the Radio Regulations, as appropriate, in order to accommodate the emerging requirements of active services, taking into account the requirements of the passive services, in bands above 71 GHz,

urges administrations

to note the possibility of changes to Article **5** to accommodate emerging requirements for active services, as indicated in this Resolution, and to take this into account in the development of national policies and regulations,

invites ITU-R

1 to continue its studies to determine if and under what conditions sharing is possible between active and passive services in the bands above

71 GHz, such as, but not limited to, 100-102 GHz, 116-122.25 GHz, 148.5-151.5 GHz, 174.8-191.8 GHz, 226-231.5 GHz and 235-238 GHz;

2 to study means of avoiding adjacent-band interference from space services (downlinks) into radio astronomy bands above 71 GHz;

3 to take into account the principles of burden-sharing to the extent practicable in their studies;

4 to complete the necessary studies when the technical characteristics of the active services in these bands are known;

5 to develop Recommendations specifying sharing criteria for those bands where sharing is feasible,

instructs the Secretary-General

to bring this Resolution to the attention of the international and regional organizations concerned.

RESOLUTION 732 (WRC-2000)

Consideration by a future competent world radiocommunication conference of issues dealing with sharing between active services above 71 GHz

The World Radiocommunication Conference (Istanbul, 2000),

considering

a) that this Conference has made changes to the Table of Frequency Allocations above 71 GHz, following consideration of science service issues;

b) that there are several co-primary active services in some bands above 71 GHz in the Table of Frequency Allocations as revised by this Conference;

c) that there is limited knowledge of characteristics of active services that may be developed to operate in bands above 71 GHz;

d) that sharing criteria for sharing between active services in bands above 71 GHz have not yet been fully developed within ITU-R;

e) that sharing between multiple co-primary active services may hinder the development of each active service in bands above 71 GHz;

f) that the technology for some active services may be commercially available earlier than for some other active services;

g) that adequate spectrum should be available for the active services for which the technology is available at a later time,

noting

that sharing criteria need to be developed, to be used by a future competent conference, for determining to what extent sharing between multiple co-primary active services is possible in each of the bands,

resolves

1 that appropriate measures should be taken to meet the spectrum requirements for active services for which the technology will be commercially available at a later time;

2 that sharing criteria be developed for co-primary active services in bands above 71 GHz;

3 that the sharing criteria developed should form the basis for a review of active service allocations above 71 GHz at a future competent conference, if necessary,

urges administrations

to note the possibility of changes to Article **5** to accommodate emerging requirements for active services, as indicated in this Resolution, and to take this into account in the development of national policies and regulations,

invites ITU-R

to complete the necessary studies with a view to presenting, at the appropriate time, the technical information likely to be required as a basis for the work of a future competent conference,

instructs the Secretary-General

to bring this Resolution to the attention of the international and regional organizations concerned.

RESOLUTION 734 (Rev.WRC-07)

Studies for spectrum identification for gateway links for high-altitude platform stations in the range from 5 850 to 7 075 MHz

The World Radiocommunication Conference (Geneva, 2007),

considering

a) that ITU has among its purposes "to promote the extension of the benefit of the new telecommunication technologies to all the world's inhabitants" (No. 6 of the Constitution);

b) that systems based on new technologies using high altitude platform stations (HAPS) can potentially be used for various applications such as the provision of high-capacity services to urban and rural areas;

c) that provision has been made in the Radio Regulations for the deployment of HAPS in specific bands, including as base stations to serve IMT-2000 networks (Article **11**);

d) that it is desirable to have adequate provision for gateway links to serve HAPS operations;

e) that ITU-R has studied spectrum sharing between HAPS as a fixed service with other fixed services and with fixed-satellite services in much higher bands, as well as the regulatory considerations to avoid interference to services in neighbouring countries,

recognizing

a) that ITU-R has studied the sharing of HAPS with fixed services in part of the 6 GHz band resulting in Recommendation ITU-R F.1764, which provides a methodology for interference evaluation that could be used for sharing studies between fixed services systems and HAPS;

b) that as in some areas the bands may be saturated with other fixed service use and it would be desirable to have greater flexibility in the choice of spectrum for gateway operations in support of HAPS networks;

c) that the World Summit on the Information Society has encouraged the development and application of emerging technologies to facilitate infrastructure and network development worldwide with special focus on underserved regions and areas;

d) that the allocations to the fixed-satellite service in the band 5 925-6 425 MHz are heavily used for Earth-to-space links providing telecommunication services, and that are particularly important for the development of infrastructure in developing countries through the deployment of VSAT capabilities;

e) that more than 160 geostationary satellites currently in operation use frequencies in the range 5 850-6 725 MHz and such use will continue to grow in the future;

f) that the band 6 725-7 025 MHz is used by uplinks in the FSS Plan of Appendix **30B** of the Radio Regulations (see No. **5.441**), while the band 5 150-5 250 MHz is used by uplinks on non-geostationary-satellite systems (see No. **5.447A**);

g) that the Earth-to-space transmissions in the FSS described in "*recognizing*" *d)*, *e)* and *f)* above will have levels much higher than those in HAPS systems and have therefore the potential for causing interference to HAPS receivers either on the ground or on the platform;

h) that in view of *recognizing g)*, HAPS use of frequencies around 6 GHz may be limited by current FSS transmit earth stations while protection of HAPS receivers may limit future deployment of these FSS earth stations,

resolves

1 to invite ITU-R to extend the sharing studies, with a view to identifying two channels of 80 MHz each for gateway links for HAPS in the range from 5 850 to 7 075 MHz, in bands already allocated to the fixed service, while ensuring the protection of existing services;

2 to recommend to WRC-11 to review the results of these studies, with a view to taking an appropriate decision for the deployment of HAPS gateway links to service the relevant stratospheric base station operations and support for these networks,

encourages administrations

to contribute actively to the sharing studies in accordance with this Resolution.

RESOLUTION 749 (WRC-07)

Studies on the use of the band 790-862 MHz by mobile applications and by other services

The World Radiocommunication Conference (Geneva, 2007),

considering

a) that the favourable propagation characteristics of the band 470-806/862 MHz are beneficial to provide cost-effective solutions for coverage, including large areas of low population density;

b) that the operation of broadcasting stations and base stations in the same geographical area may create incompatibility issues;

c) that, according to Resolution **646 (WRC-03)**, the bands 764-776 MHz and 794-806 MHz are currently used in some countries for Public Protection and Disaster Relief (PPDR); and the bands 806-866 MHz (in Region 2) and 806-824 MHz and 851-869 MHz (in Region 3) are currently identified for PPDR;

d) that many communities are particularly underserved compared to urban centres;

e) that applications ancillary to broadcasting are sharing the band 470-862 MHz with the broadcasting service in all three Regions, and are expected to continue their operations in this band;

f) that it is necessary to adequately protect, *inter alia*, terrestrial television broadcasting and other systems in this band,

recognizing

a) that, in Article **5** of the Radio Regulations, the band 790-862 MHz, or parts of that band, is allocated, and is used on a primary basis for services other than broadcasting;

b) that the frequency band 470-806/862 MHz is allocated to the broadcasting service on a primary basis in all three Regions and used

predominantly by this service, and that the GE06 Agreement applies in all Region 1 countries except Mongolia and one country in Region 3;

c) that the transition from analogue to digital television is expected to result in situations where the band 790-862 MHz will be used for both analogue and digital terrestrial transmission; and the demand for spectrum during the transition period may be even greater than the stand-alone usage of analogue broadcasting systems;

d) the switch-over to digital may result in spectrum opportunities for new applications;

e) the timing of the switch-over to digital is likely to vary from country to country;

f) that the use of spectrum for different services should take into account the need for sharing studies;

g) that the Radio Regulations provide that the identification of a given band for IMT does not preclude the use of that band by any application of the services to which it is allocated and does not establish priority in the Radio Regulations;

h) that the GE06 Agreement contains provisions for the terrestrial broadcasting service and other terrestrial services, a Plan for digital TV, and the List of other primary terrestrial services,

noting

that Resolution ITU-R 57 provides principles for the process of development of IMT-Advanced and this process is planned to start after this Conference,

emphasizing

a) that the use of the band 470-862 MHz by broadcasting and other primary services is also covered by the GE06 Agreement;

b) that the requirements of the different services to which the band is allocated, including mobile and broadcasting services, shall be taken into account,

resolves

1 to invite ITU-R to conduct sharing studies for Regions 1 and 3 in the band 790-862 MHz between the mobile service and other services in order to protect the services to which the frequency band is currently allocated;

2 to invite ITU-R to report the results of the studies referred to in *resolves* 1 for consideration by WRC-11 to take appropriate action,

invites administrations

to participate in the studies by submitting contributions to ITU-R.

invites the Director of the Telecommunication Development Bureau

to draw the attention of the Telecommunication Development Sector to this Resolution.

RESOLUTION 753 (WRC-07)

Use of the band 22.55-23.15 GHz by the space research service

The World Radiocommunication Conference (Geneva, 2007),

considering

a) that there is growing interest around the world in the comprehensive space exploration in particular around the Moon;

b) that the lunar exploration missions, examining the terrain, environment and potential landing sites, will be robotic for the foreseeable future and manned in the long term;

c) that a primary space research service (space-to-Earth) allocation in the band 25.5-27.0 GHz was added to the Table of Frequency Allocations to support a wide range of space research missions;

d) that space research service (space-to-Earth) transmissions in the 25.5-27.0 GHz band will be used to support space research service missions in near-Earth orbit, including missions in transit to the Moon and at or near the Moon;

e) that the space research service (space-to-Earth) transmissions in the 25.5-27.0 GHz band will be used for both scientific data retrieval and voice/videocommunication with the Earth;

f) that there is a need for a companion uplink space research service (Earth-to-space) band to provide the mission data, command and control links for the lunar exploration missions;

g) that due to the potential for many concurrent exploration-related systems and the large bandwidth requirements of these systems, especially those supporting manned missions, it is envisaged that a total uplink bandwidth of at least several hundred MHz will be needed;

h) that the 22.55-23.15 GHz band is far enough from the 25.5-27.0 GHz band to provide adequate frequency separation;

i) that the 22.55-23.55 GHz band is used by data relay satellite systems to communicate with user satellites (forward links) in the existing primary inter-satellite service allocation;

j) that the 22.55-23.15 GHz band is the logical companion band to provide the necessary uplink bandwidth and by using the same band as data relay satellite systems in *considering i)* for radiocommunication in the Earth-to-space direction, it provides a degree of redundancy and coverage that may prove vital for future missions,

recognizing

1 that the band 22.55-23.55 GHz is allocated to the fixed, inter-satellite and mobile services;

2 that the inter-satellite forward links in the 22.55-23.55 GHz band are paired with inter-satellite return links in the 25.25-27.5 GHz band;

3 that non-GSO inter-satellite service links have been operating for several years and are expected to continue to operate in the 23.183-23.377 GHz band and that these links are increasingly being used in situations of emergencies and natural disasters;

4 that systems referred to in *recognizing* 1 need to be protected and their future requirements be taken into account,

resolves

1 to invite ITU-R to conduct sharing studies between space research service systems operating in the Earth-to-space direction and the fixed, inter-satellite and mobile services in the band 22.55-23.15 GHz, and to recommend appropriate sharing criteria for an allocation to the space research service in the Earth-to-space direction;

2 to invite WRC-11 to review the results of the studies under *resolves* 1 and consider the inclusion of the sharing criteria within the Radio Regulations and appropriate modifications to the Table of Frequency Allocations,

invites administrations

to contribute to the sharing studies between the space research service and the fixed, inter-satellite and mobile services in the 22.55-23.15 GHz band,

invites ITU-R

to complete the necessary studies, as a matter of urgency, taking into account the present use of the allocated band, with a view to presenting, at the appropriate time, the technical information likely to be required as a basis for the work of the conference,

instructs the Secretary-General

to bring this Resolution to the attention of the international and regional organizations concerned.

RESOLUTION 754 (WRC-07)

Consideration of modification of the aeronautical component of the mobile service allocation in the 37-38 GHz band for protection of other primary services in the band

The World Radiocommunication Conference (Geneva, 2007),

considering

a) that the band 37-38 GHz is allocated on a primary basis to the fixed, mobile and space research (space-to-Earth) services, and the 37.5-38 GHz portion of this band is also allocated on a primary basis to the fixed-satellite service (space-to-Earth);

b) that an aeronautical mobile station can cause unacceptable interference to receivers in the fixed service (including high-density applications), as well as land mobile, maritime mobile and fixed-satellite (space-to-Earth) receivers within line-of-sight;

c) that an aeronautical mobile station can cause unacceptable interference to receivers in the space research service whenever it is within line-of-sight of the receiver, as indicated in Recommendation ITU-R SA.1016;

d) that interference from the emissions of an aeronautical mobile station to a space research service earth station receiver may significantly exceed the permissible interference levels for extended periods of time, thus jeopardizing the success of a space mission,

recognizing

a) that the Table of Frequency Allocations already excludes the operation of aeronautical mobile stations in the bands 2.29-2.3 GHz, 8.4-8.5 GHz and 22.21-22.5 GHz where the mobile service is co-allocated on a primary basis with the space research service (space-to-Earth), and in the 31.5-31.8 GHz band where the mobile service is allocated on a secondary basis;

b) that the Table of Frequency Allocations also already excludes the operation of aeronautical mobile stations in many bands where the mobile service is co-allocated on a primary basis with the fixed service, such as in the band 11.7-12.5 GHz and the fixed service and the fixed-satellite service (space-to-Earth), such as 7 300-7 750 MHz;

c) that No. **5.547** indicates that the 37-38 GHz band is available for high-density applications in the fixed service;

d) that use of the 37-38 GHz band is required to support the increased data requirements of planned manned and scientific missions,

noting

a) that aeronautical mobile service systems are currently neither deployed nor planned in the 37-38 GHz band;

b) that sharing studies between the space research service (space-to-Earth) and the aeronautical mobile service have already begun,

resolves

1 to invite ITU-R to conduct appropriate studies involving the aeronautical mobile service and the affected primary services in the band 37-38 GHz in order to determine the compatibility of the aeronautical mobile service with these other services;

2 to invite WRC-11 to review the results of the studies under *resolves* 1 and consider the inclusion of any appropriate compatibility criteria within the Radio Regulations or appropriate modifications to the Table of Frequency Allocations,

invites ITU-R

to complete the necessary studies, as a matter of urgency, taking into account the present use of the allocated band, with a view to presenting, at the appropriate time, the technical information likely to be required as a basis for the work of the Conference,

invites administrations

to contribute to the compatibility studies between the aeronautical mobile service and the other services in the 37-38 GHz band,

instructs the Director of the Radiocommunication Bureau

to bring this Resolution to the attention of the international and regional organizations concerned.

RESOLUTION 950 (Rev.WRC-07)

Consideration of the use of the frequencies between 275 and 3 000 GHz

The World Radiocommunication Conference (Geneva, 2007),

considering

a) that, in the Table of Frequency Allocations, frequency bands above 275 GHz are not allocated;

b) that, notwithstanding *considering a)*, No. **5.565** makes provision for the use of the frequency band 275-1 000 GHz for experimentation with, and development of various passive services and all other services and recognizes the need to conduct further research;

c) that No. **5.565** also makes provision for the protection of passive services until, and if, such time as the Table of Frequency Allocations may be extended;

d) that, in addition to the spectral lines identified by No. **5.565**, research activities in the bands above 275 GHz may yield other spectral lines of interest, such as those listed in Recommendation ITU-R RA.314;

e) that within various Radiocommunication Study Groups, studies on systems between 275 and 3 000 GHz, including system characteristics of suitable applications, are being considered;

f) that the present use of the bands between 275 and 3 000 GHz is mainly related to the passive services, however, with anticipated technology development, the bands may become increasingly important for suitable active service applications;

g) that sharing studies in ITU-R among passive services and all other services operating in frequencies between 275 and 3 000 GHz have not been completed;

h) that the lack of use to date of the band 275-3 000 GHz by the various active services indicates a general consideration of frequency allocations above 275 GHz may be premature,

recognizing

a) that propagation characteristics at frequencies above 275 GHz, such as atmospheric absorption and scattering, have a significant impact on the performance of both active and passive systems and need to be studied;

b) that it is necessary to investigate further the potential uses of the bands between 275 and 3 000 GHz by suitable applications,

noting

a) that significant infrastructure investments are being made under international collaboration for the use of these bands between 275 and 3 000 GHz, for example, the Atacama Large Millimetre Array (ALMA), a facility under construction that will provide new insights on the structure of the universe;

b) that Radiocommunication Bureau Circular Letter CR/137 identified additional information for the Bureau to record characteristics of active and passive sensors for Earth exploration-satellite service and space research service satellites, in frequency bands below 275 GHz,

further noting

a) that a process and format similar to that provided in *noting b)* could be used to record systems operating in the 275 to 3 000 GHz band;

b) that recording active and passive systems operating in the 275 to 3 000 GHz band will provide information until the date when, and if, it is determined that changes to the Radio Regulations are needed,

resolves

1 to review No. **5.565**, excluding frequency allocations, in order to update the spectrum use between 275 GHz and 3 000 GHz by the passive services at WRC-11, taking into account the result of the ITU-R studies;

2 that administrations may submit for inclusion in the Master International Frequency Register details on systems which operate between 275 and 3 000 GHz and which may be recorded by the Radiocommunication Bureau under Nos. **8.4**, **11.8** and **11.12**,

invites ITU-R

to conduct the necessary studies in time for consideration by WRC-11 with a view to the modification of No. **5.565**, including advice on the applications suitable for the band 275-3 000 GHz,

instructs the Director of the Radiocommunication Bureau

to accept submissions referred to in *resolves* 2, and to record them in the Master International Frequency Register.

RESOLUTION 951 (Rev.WRC-07)

Enhancing the international spectrum regulatory framework

The World Radiocommunication Conference (Geneva, 2007),

considering

a) that radio spectrum is a finite resource and there is a continued increase and evolution in demand and multiplicity of existing and future applications for radiocommunications;

b) that the current technological environment for some applications is substantively different from the one which prevailed when the current allocation principles and definitions were established;

c) that past WRCs were able to respond to the developments mentioned under *considering a)* and *b)* in certain cases;

d) that there is a keen interest in the rational, efficient and economic use of spectrum;

e) that allocations to radiocommunication services should aim to reach the best outcome in terms of spectrum efficiency;

f) that applications are emerging in which elements of different radiocommunication services (as defined in the Radio Regulations) are combined;

g) that there is a convergence of radio technologies, inasmuch as the same radio technology can be used in systems that operate in different radiocommunication services or with different allocation status (primary or secondary), that might have an impact on the allocation scenario;

h) that similar data rates and quality of service attributes are available with different radiocommunication systems operating in different radiocommunication services;

i) that the use of modern underlying communication architectures and protocols, such as those used in packet radio systems, enables the concurrent

provision of different applications from the same platform operating in the same frequency bands;

j) that evolving and emerging radiocommunication technologies may enable sharing possibilities and may lead to more frequency-agile and interference-tolerant equipment and consequently to more flexible use of spectrum;

k) that these evolving and emerging technologies may not require band segmentation within the traditional spectrum allocation framework;

l) that the regulatory procedures should be continually assessed in order to meet the demands of administrations,

recognizing

a) that the rights of administrations to deploy, operate and protect services should be the guiding principle;

b) that the studies in response to Resolution **951 (WRC-03)** have shown that any change intended to improve the flexibility of administrations in accommodating converging services has to rely on a combination of service definitions, allocations and procedures,

noting

a) that one of the purposes of the Radio Regulations is the effective management and use of spectrum;

b) that World Radiocommunication Conferences shall normally be convened every three to four years for possible amending of the Radio Regulations;

c) that the studies initiated under Resolution **951 (WRC-03)** have shown a need for additional studies,

resolves

1 that, as a matter of urgency, taking into account Annexes 1 and 2, studies are to be continued by ITU-R, in order to develop concepts and procedures for enhancing the Radio Regulations to meet the demands of

current, emerging and future radio applications, while taking into account existing services and usage;

2 that the studies mentioned in *resolves* 1 shall be limited to general allocation or procedural issues relating to general spectrum management solutions, such as those already developed in Annex 1, in line with the process contained in Annex 2;

3 to invite WRC-11 to take into consideration the results of these studies, including sharing and their impact on allocations in the concerned frequency bands, and take appropriate action in accordance with Annex 2,

invites ITU-R

to conduct the necessary studies in time for consideration by WRC-11 and in accordance with this Resolution,

invites administrations

to participate actively in the studies by submitting contributions to ITU-R.

ANNEX 1 TO RESOLUTION 951 (Rev.WRC-07)

Options for enhancing the international spectrum regulatory framework*

The following four possible options have been so far identified in order to develop concepts and procedures for enhancing the Radio Regulations; a combination of these options as well as other options may also be used.

Option 1 is keeping the current practice as it is.

* Further information can be found in Document 24 to WRC-07.

Option 2 is reviewing and possibly revising the current service definitions or adding a new service to the list of service definitions, which would encompass several of the existing ones.

Option 3 is the introduction of a new provision in the Radio Regulations enabling substitution[1] between assignments of specific services.

Option 4 is the introduction of composite services in the Table of Frequency Allocations.

NOTE – For Options 2, 3 and 4, improved forms of notices associated with existing Appendix **4**, and/or relevant adjustments to this Appendix, should be considered.

1 Option 1: Keeping current practice

Under this option, it is considered that there is sufficient flexibility within the present Radio Regulations and the WRC process to meet any current or likely future requirements within the time-frame typically set forth for WRCs.

Under this option, national regulation may be appropriate to provide relevant solutions to the changing environment.

Although new applications may be introduced in a shorter time-frame, this would be without protection against harmful interference, which may not be practical for the vast majority of emerging wireless applications, including IMT, scientific, public safety, radiolocation, radionavigation, broadcast and fixed/mobile/broadcast satellite systems.

The current service definitions in Article **1** of the Radio Regulations appear to have generally enabled the Radio Regulations to be adapted dynamically to latest technology evolution such as IMT, HAPS, RLANs, digital TV, public protection and disaster relief (PPDR) and scientific community interests.

It was noted that, in spite of different definitions for the fixed and mobile (except aeronautical and maritime) services, in most frequency bands where

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1 This term needs to be clarified and defined properly.

one of the two services is allocated, the other one is also allocated. This indicates that convergence is already achieved in the ITU Table of Frequency Allocations, except in some frequency bands, where allocations to both services may be considered on a band-by-band basis by future WRCs, as required.

2 Option 2: Review and possibly revise some of the service definitions

Under this approach, the current service definitions in Article **1** of the Radio Regulations would be reviewed in order to ensure that they adequately and clearly cover actual use while providing flexibility for emerging technologies. After an extensive consultation within the ITU-R Study Groups, this review may encompass the fixed and mobile (except aeronautical and maritime mobile) services and possibly other services, if considered appropriate[2]. It may lead to reviewing the current definitions for these services and modifying them as necessary.

Possible changes to the service definitions would need to be addressed from the point of view of their regulatory implications in the assignment and use of frequencies, in particular in the ITU coordination, notification and recording processes, impact on assignments made under the current definitions, and impact on other services.

3 Option 3: Introduction of a new provision in the Radio Regulations enabling substitution between assignments of specific services

Under this approach, a new provision would be introduced in the Radio Regulations in order to enable substitution between assignments of specific services. For example, in the context of fixed and mobile (except maritime and aeronautical mobile) services, substitution could be applied in the same way as it is applied by Nos. **5.485** or **5.492** in the context of the fixed-satellite and broadcasting-satellite services.

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2 The ITU-R studies indicated that the current definition of the fixed-satellite service has been able to accommodate new technologies and applications in the fixed-satellite service.

Using the example of fixed and mobile services, this could reflect the current convergence between the services, address the current ambiguities between the definitions of these services, facilitate the timely implementation of new applications, provide adequate regulatory protection for such applications, and protect the rights of other administrations against interference caused by them.

A new provision enabling substitution would need to be addressed from the point of view of its regulatory implications in the assignment and use of frequencies, in particular in the ITU coordination, notification and recording processes, impact on assignments made under the current definitions, and impact on other services.

4 Option 4: Introduction of composite services in the Table of Frequency Allocations

Under this approach, which could reflect the convergence between some radiocommunication services in a specific frequency band, the Table of Frequency Allocations (Article **5** of the RR) could be modified by replacing the current separate allocations to some radiocommunication services by a joint allocation to these services (e.g. a specific frequency band allocated to the "fixed service" and to the "land mobile service" could be modified to a composite allocation of "fixed and land mobile service"). The above approach would only be applicable if all concerned services referred to in the allocation to the composite services have equal regulatory status.

This approach would provide administrations with increased flexibility. In the example above, administrations could opt for either the fixed service alone, for the land mobile service alone, for separate applications in both services in an independent manner, or for a composite application which would include both services. This option would not require any revision to the current definitions of the concerned radiocommunication services (i.e. neither to the fixed nor to the land mobile service).

To enable the notification and recording of frequency assignments in such a composite service, a new class of station could be introduced named "Station in the fixed and land mobile service" (with a separate symbol than those used for the fixed and land mobile service), with appropriate forms of notice, or other adequate notification mechanisms.

ANNEX 2 TO RESOLUTION 951 (Rev.WRC-07)

Guidelines for implementing this Resolution

These guidelines contain three steps:

1 *Step 1*: Evaluate various options including those in Annex 1 as to their usefulness regarding the enhancement of spectrum management solutions to meet the objectives of this Resolution.

2 *Step 2*: Develop concepts and procedures based on the options evaluated in Step 1 including sharing studies on a band-by-band basis.

3 *Step 3*: Prepare, based on Step 2, technical and regulatory solutions for consideration and appropriate action at WRC-11.

RESOLUTION 953 (WRC-07)

Protection of radiocommunication services from emissions by short-range radio devices

The World Radiocommunication Conference (Geneva, 2007),

considering

a) that short-range radio devices (SRDs) are radio transmitters or receivers, or both, and hence are not considered as industrial, scientific and medical (ISM) applications under No. **1.15**;

b) that SRDs, including devices using ultra-wideband (UWB) technologies, radio-frequency identification devices (RFIDs), and other similar devices, generate and use radio frequencies locally;

c) that SRDs cannot claim protection from interference from radio services and therefore have been developed in priority in ISM frequency bands;

d) that there is an increasing amount of SRDs proliferating across various frequencies throughout the spectrum, such as devices using UWB technologies or RFIDs, etc.;

e) that in some cases considerable energy may be radiated by RFIDs;

f) that some radio services, especially those using low field strengths, may suffer harmful interference from SRDs, in particular RFIDs, a risk which is unacceptable, particularly in the case of radionavigation or other safety services,

recognizing

a) the work carried out by ITU-R resulting in relevant ITU-R Recommendations (see ITU-R SM.1538, ITU-R SM.1754, ITU-R SM.1755, ITU-R SM.1756, ITU-R SM.1757);

b) the work carried out by ITU-T on RFID;

c) that SRDs, in particular RFIDs, hold promise for an array of new applications that may provide benefits for users;

d) that the characteristics of RFIDs, including the power of the transmitter, are standardized in the framework of the International Organization for Standardization (ISO),

recognizing further

Resolution ITU-R 54 of the Radiocommunication Assembly (Geneva, 2007), which resolves that ITU-R should study the capabilities of SRDs while ensuring protection of radiocommunication services,

resolves

that, to ensure that radiocommunication services are adequately protected, further studies are required on the emissions from SRDs, inside and outside the frequency bands designated in the Radio Regulations for ISM applications,

invites ITU-R

to study emissions from SRDs, in particular RFIDs, inside and outside the frequency bands designated in the Radio Regulations for ISM applications to ensure adequate protection of radiocommunication services,

invites administrations

to participate in the studies by submitting contributions to ITU-R,

instructs the Director of the Radiocommunication Bureau

1 to bring this Resolution to the attention of ITU-T, ISO and the International Electrotechnical Commission (IEC);

2 to provide the results of these studies to WRC-11 for its considerations and actions.

RESOLUTION 954 (WRC-07)

Harmonization of spectrum for use by terrestrial electronic news gathering[1] systems

The World Radiocommunication Conference (Geneva, 2007),

considering

a) that the use of terrestrial portable radio equipment by services ancillary to broadcasting, commonly described as electronic news gathering (ENG), operating in the bands allocated to the broadcasting, fixed and mobile services has become an important element in the comprehensive coverage of a wide range of internationally noteworthy events, including natural disasters;

b) that WRC-03 initiated studies concerned with spectrum usage and operational characteristics of portable and nomadic links for terrestrial ENG systems operation on a global basis, in accordance with Recommendation **723 (WRC-03)***;

c) that modularization and miniaturization of terrestrial ENG systems has increased the portability for these systems and has thus increased the trend towards cross-border operation of ENG equipment;

d) that the technical characteristics for television outside broadcast, ENG and electronic field production systems in the fixed and mobile services for use in sharing studies have been established in ITU-R Recommendations,

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1 For the purpose of this Resolution, ENG represents all applications ancillary to broadcasting, such as terrestrial electronic news gathering, electronic field production, TV outside broadcast, wireless radio microphones and radio outside production and broadcast.

* *Note by the Secretariat:* This Recommendation was abrogated by WRC-07.

noting

a) that studies undertaken by ITU-R indicate that national spectrum management could benefit from globally harmonized band planning for ENG systems;

b) that ENG-related studies in ITU-R are based on data for current and anticipated ENG spectrum requirements collected from many administrations in all regions;

c) that some of the frequency bands currently used for ENG have a number of technical and operational attributes making them suitable for continued long-term use for ENG;

d) that lower frequency spectrum bands tend to provide better propagation characteristics over obstructed paths, thereby increasing the reliability of ENG links operating in these bands,

recognizing

a) that broadcasters now embrace advanced digital technologies that open new opportunities for both fixed and mobile ENG operations, and that these developments have spectrum related implications;

b) that the dynamic nature of the use of ENG is driven by scheduled, unscheduled and unpredictable events such as breaking news, emergencies and disasters;

c) that news gathering and electronic production typically takes place in an environment where several television broadcasters/organizations/networks attempt to cover the same event, creating a demand for multiple ENG links and increased demand for access to spectrum in suitable frequency bands;

d) that access to a globally harmonized spectrum is highly desirable to facilitate the rapid and less restricted deployment and operation of ENG systems from one country to another,

resolves

1 that, based on studies undertaken by ITU-R, WRC-11 should address the feasibility of achieving a satisfactory degree of

worldwide/regional harmonization of spectrum for ENG use in terms of the frequency bands and tuning ranges;

2 that methods should be identified for the possible harmonization of frequency bands and tuning ranges for ENG usage,

invites ITU-R

1 to carry out studies of ENG regarding possible solutions for global/regional harmonization in frequency bands and tuning ranges, taking into account:

– available technologies to maximize efficient and flexible use of frequency;

– system characteristics and operational practices which facilitate the implementation of these solutions;

2 to include in the studies referred to above sharing and compatibility issues with services already having allocations in frequency bands and tuning ranges which have potential for ENG use;

3 to propose operational measures to facilitate operation of ENG equipment consistent with global circulation of radiocommunication equipment, taking into account Recommendation ITU-R M.1637;

4 to report the results of those studies to the World Radiocommunication Conference 2011,

invites administrations

to participate in the studies by submitting contributions to ITU-R.

RESOLUTION 955 (WRC-07)

Consideration of procedures for free-space optical links

The World Radiocommunication Conference (Geneva, 2007),

considering

a) that frequencies above 3 000 GHz are already used for various optical applications from telecommunication links to satellite remote sensing;

b) that optical links are currently under consideration by several ITU-R Study Groups;

c) that Recommendations ITU-R P.1621, ITU-R P.1622, ITU-R S.1590, ITU-R RA.1630, ITU-R SA.1742, ITU-R SA.1805 and ITU-R RS.1744 contain information pertaining to free-space optical links and remote sensing;

d) that ITU-R is in the process of preparing reports regarding the possibility and relevance of including in the Radio Regulations frequency bands above 3 000 GHz as well as fixed service applications using such frequency bands,

recognizing

a) that Resolution 118 (Marrakesh, 2002) of the Plenipotentiary Conference *instructs the Director of the Radiocommunication Bureau* to report to world radiocommunication conferences on the progress of ITU-R studies concerning the use of frequencies above 3 000 GHz;

b) that ITU-R has identified technical aspects regarding the use of optical free-space telecommunications as an item requiring urgent study by the ITU-R Study Groups,

resolves

to consider possible procedures for free-space optical links, taking into account the results of ITU-R studies covering at least sharing aspects with

other services, a clear definition of the band limits and measures to be considered if allocations to various services in the Radio Regulations above 3 000 GHz are considered feasible,

invites ITU-R

to conduct the necessary studies in time for consideration by WRC-11.

RESOLUTION 956 (WRC-07)

Regulatory measures and their relevance to enable the introduction of software-defined radio and cognitive radio systems

The World Radiocommunication Conference (Geneva, 2007),

considering

a) that cognitive radio and self-configuring networks are expected to provide additional flexibility and improved efficiency to the overall spectrum use;

b) that ITU-R is already studying such advanced radio technologies, their functionalities, the key technical characteristics, requirements, performance and benefits (Question ITU-R 241/8);

c) that studies have shown that software defined radio using cognitive control mechanisms is an approach for achieving better spectrum utilization, dynamic spectrum management, and flexible spectrum use (Report ITU-R M.2064)*;

d) that considerable research and development is being carried out on cognitive radio systems and related network configurations such as self-configuring networks;

e) that cognitive radio systems may cover a number of radio access techniques (RATs);

f) that cognitive radio systems include self-configuring networks of different network topologies that will be able to set their spectrum usage based on the locally available spectrum;

g) that without any information about the location and characteristics of other RATs within the covered frequency range reachable from the

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* *Note by the Secretariat*: This Report was suppressed in June 2007. The subject matter is now covered by Report ITU-R M.2117.

mobile terminal, it will be necessary to scan the whole tuning range in order to discover the local spectrum usage, which will result in a huge power and time consumption;

h) that without additional means, it may not be possible to discover receive-only usage;

i) that some studies indicate usefulness to have means to assist in the determination of the local spectrum usage, such as wireless or wired access to a database or to other networks;

j) that some studies indicate a possible need for a worldwide harmonized cognitive supporting pilot channel with a bandwidth less than 50 kHz, whilst other studies indicate that the availability of a database could support access and connectivity, and therefore support the use of these systems,

resolves to invite ITU-R

1 to study whether there is a need for regulatory measures related to the application of cognitive radio system technologies;

2 to study whether there is a need for regulatory measures related to the application of software-defined radio,

resolves further

that WRC-11 consider the results of these studies and take the appropriate actions.

RECOMMENDATION 206 (WRC-07)

Consideration on the possible use of integrated mobile-satellite service and ground component systems in some frequency bands identified for the satellite component of International Mobile Telecommunications

The World Radiocommunication Conference (Geneva, 2007),

considering

a) that mobile-satellite service (MSS) systems may provide service to a wide area;

b) that MSS systems have a limited capacity for providing reliable radiocommunication services in urban areas on account of natural or man-made obstacles and that the ground component of an integrated MSS system can mitigate blockage areas, as well as allow for indoor service coverage;

c) that MSS systems can improve coverage of rural areas, thus being one element that can bridge the digital divide in terms of geography;

d) that MSS systems are suitable for public protection and disaster relief communications, as stated in Resolution **646 (WRC-03)**;

e) that the bands 1 525-1 544 MHz, 1 545-1 559 MHz, 1 610-1 626.5 MHz, 1 626.5-1 645.5 MHz, 1 646.5-1 660.5 MHz and 2 483.5-2 500 MHz are among those identified in Resolution **225 (Rev.WRC-07)** for administrations wishing to implement the satellite component of International Mobile Telecommunications (IMT);

f) that the bands mentioned in *considering e)* are allocated on a primary basis to the mobile-satellite services and other services and that not all of them are allocated to the mobile service;

g) that the bands 1 980-2 010 MHz and 2 170-2 200 MHz are identified for use by the satellite component of IMT-2000 in accordance with Resolution **212 (Rev.WRC-07)**;

h) that within their territories in some or parts of the bands identified in *considering e)* and *g)* and in parts of the band 2 010-2 025 MHz in some countries in Region 2, some administrations have authorized or plan to authorize MSS system operators to establish an integrated ground component to their MSS systems ("Integrated System") and under certain conditions determined at the national level such as:

i) the ground component is complementary to, and operates as an integral part, of the MSS system and, together with the satellite component, provides an integrated service offering;

ii) the ground component is controlled by the satellite resource and network management system;

iii) the ground component uses the same designated portions of the frequency band as the associated operational MSS system;

i) that ITU-R has performed frequency sharing studies and has determined that the coexistence between independent systems in the MSS and systems in the mobile services in the same spectrum without harmful interference is not feasible in the same or adjacent geographical area,

recognizing

a) that ITU-R has not performed studies on sharing, technical or regulatory issues with regard to integrated MSS and ground component systems, but that some administrations have performed such studies;

b) that the radionavigation-satellite service in the 1 559-1 610 MHz band and the radio astronomy service in the bands 1 610.6-1 613.8 MHz and 1 660-1 670 MHz need to be protected from harmful interference;

c) that the MSS needs to be protected from harmful interference that may be caused by the introduction of the ground component of Integrated Systems;

d) that Nos. **5.353A** and **5.357A** are applicable to MSS systems in different portions of the bands 1 525-1 559 MHz and 1 626.5-1 660.5 MHz with respect to the spectrum requirements and prioritization of communications for the Global Maritime Distress and Safety System and the aeronautical mobile-satellite (R) service,

noting

a) that the combined wide-area and urban coverage capabilities of Integrated Systems may contribute to meeting the particular needs of developing countries such as is noted in Resolution **212 (Rev.WRC-07)**;

b) that some administrations that are planning to implement or are implementing Integrated Systems within their national territories have imposed limitations, in rules and authorization actions, on the e.i.r.p. density that the ground component of such systems may produce into bands allocated to the radionavigation-satellite service;

c) that there are a limited number of frequency bands allocated to the MSS, that these bands are already congested, and that the introduction of integrated ground components may in some instances make spectrum access for other MSS systems more difficult;

d) that administrations implementing Integrated Systems may provide, in bilateral consultations of administrations, information on system characteristics of the ground component,

recommends

to invite ITU-R to conduct studies, as appropriate, taking into account existing systems and those proposed to be used soon and the above *considering*, *recognizing* and *noting*,

invites administrations

to participate as necessary in the ITU-R studies taking into account *recognizing a)*.

RECOMMENDATION 207 (WRC-07)

Future IMT systems

The World Radiocommunication Conference (Geneva, 2007),

considering

a) that the future development of IMT is being studied by ITU-R in accordance with Recommendation ITU-R M.1645 and further Recommendations are to be developed for IMT-Advanced;

b) that the future development of IMT is foreseen to address the need for higher data rates than those of currently deployed IMT systems;

c) the need to define the requirements associated with ongoing enhancement of future IMT systems,

noting

a) the ongoing relevant studies by ITU-R on IMT-Advanced, in particular the outputs from Question ITU-R 229-1/8;

b) the need to take into consideration requirements of applications of other services,

recommends

to invite ITU-R to study as necessary technical, operational and spectrum related issues to meet the objectives of future IMT systems.

RECOMMENDATION 724 (WRC-07)

Use by civil aviation of frequency allocations on a primary basis to the fixed-satellite service

The World Radiocommunication Conference (Geneva, 2007),

considering

a) that remote and rural areas often still lack a terrestrial communication infrastructure that meets the evolving requirements of modern civil aviation;

b) that the cost of providing and maintaining such an infrastructure could be expensive, particularly in remote regions;

c) that satellite communication systems operating in the fixed-satellite service (FSS) may be the only medium to satisfy the requirements of the International Civil Aviation Organization's (ICAO) communication, navigation, surveillance and air traffic management (CNS/ATM) systems, where an adequate terrestrial communication infrastructure is not available;

d) that the use of VSAT systems, operating in the FSS and being deployed on a large scale in aeronautical communications, has the potential to significantly enhance communications between air traffic control centres as well as with remote aeronautical stations;

e) that establishing and utilizing satellite communication systems for civil aviation would also bring benefits for developing countries and countries with remote and rural areas by enabling the use of VSAT systems for non-aeronautical communications;

f) that in the cases identified in *considering e)* it is necessary to draw attention to the importance of aeronautical communications as opposed to non-aeronautical communications,

noting

a) that the FSS is not a safety service;

b) that Resolution **20 (Rev.WRC-03)** *resolves to instruct the Secretary-General* "to encourage ICAO to continue its assistance to developing countries which are endeavouring to improve their aeronautical telecommunications ...",

recommends

1 that administrations, in particular in developing countries and in countries with remote and rural areas, recognize the importance of VSAT operations to the modernization of civil aviation telecommunications systems and encourage the implementation of VSAT systems that could support both aeronautical and other communication requirements;

2 that administrations in developing countries be encouraged, to the maximum extent possible and as necessary, to expedite the authorization process to enable aeronautical communications using VSAT technology;

3 that arrangements should be made to provide for urgent service restoration or alternative routing in case of a disruption of a VSAT link associated with the aeronautical communications;

4 that administrations implementing VSAT systems in accordance with *recommends* 1 to 3 should do so in satellite networks operating in frequency bands with a primary allocation to the satellite services;

5 to invite ICAO, noting Resolution **20 (Rev.WRC-03)**, to continue its assistance to developing countries to improve their aeronautical telecommunications, including interoperability of VSAT networks, and provide guidance to developing countries on how they could best use VSAT technology for this purpose,

requests the Secretary-General

to bring this Recommendation to the attention of ICAO.