

International Telecommunication Union

World Radiocommunication Conference 2015 (WRC-15)

Agenda and Relevant Resolutions



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World Radiocommunication Conference 2015 (WRC-15)

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Agenda and Relevant Resolutions



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PREFACE

In accordance with [Council Resolution 1343 \(C12\)](#), the forthcoming World Radiocommunication Conference will take place in Geneva from 2 to 27 November 2015 and will be a new landmark for the radiocommunication world and the use of the radio-frequency spectrum and satellite orbits.

This booklet provides an easy access to the WRC-15 agenda as well as to the pertinent resolutions referenced therein. It has been prepared in close cooperation with the International Amateur Radio Union (www.iau.org), following its past initiatives and in order to maintain this good tradition to better assist the ITU membership in the preparations for the conference.

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.

François Rancy
Director, Radiocommunication Bureau

Council RESOLUTION 1343 (C12)

**Place, dates and agenda of the World
Radiocommunication Conference (WRC-15)**

The Council,

noting

that [Resolution 807](#) of the World Radiocommunication Conference (Geneva, 2012):

- a) resolved to recommend to the Council that a world radiocommunication conference be held in 2015 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-15 and to initiate as soon as possible the necessary consultation with Member States,

resolves

to convene a World Radiocommunication Conference (WRC-15) in Geneva (Switzerland) from 2-27 November 2015, preceded by the Radiocommunication Assembly from 26-30 October 2015, with the following agenda:

1 on the basis of proposals from administrations, taking account of the results of WRC-12 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 in respect of the following items:

1.1 to consider additional spectrum allocations to the mobile service on a primary basis and identification of additional frequency bands for International Mobile Telecommunications (IMT) and related regulatory provisions, to facilitate the development of terrestrial mobile broadband applications, in accordance with [Resolution 233 \(WRC-12\)](#);

1.2 to examine the results of ITU-R studies, in accordance with [Resolution 232 \(WRC-12\)](#), on the use of the frequency band 694-790 MHz by the mobile, except aeronautical mobile, service in Region 1 and take the appropriate measures;

1.3 to review and revise [Resolution 646 \(Rev.WRC-12\)](#) for broadband public protection and disaster relief (PPDR), in accordance with [Resolution 648 \(WRC-12\)](#);

1.4 to consider possible new allocation to the amateur service on a secondary basis within the band 5 250-5 450 kHz in accordance with [Resolution 649 \(WRC-12\)](#);

1.5 to consider the use of frequency bands allocated to the fixed-satellite service not subject to Appendices **30**, **30A** and **30B** for the control and non-payload communications of unmanned aircraft systems (UAS) in non-segregated airspaces, in accordance with [Resolution 153 \(WRC-12\)](#);

1.6 to consider possible additional primary allocations:

1.6.1 to the fixed-satellite service (Earth-to-space and space-to-Earth) of 250 MHz in the range between 10 GHz and 17 GHz in Region 1;

1.6.2 to the fixed-satellite service (Earth-to-space) of 250 MHz in Region 2 and 300 MHz in Region 3 within the range 13-17 GHz;

and review the regulatory provisions on the current allocations to the fixed-satellite service within each range, taking into account the results of ITU-R studies, in accordance with [Resolutions 151 \(WRC-12\)](#) and [152 \(WRC-12\)](#), respectively;

1.7 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-geostationary mobile-satellite systems in the mobile-satellite service) in accordance with [Resolution 114 \(Rev.WRC-12\)](#);

1.8 to review the provisions relating to earth stations located on board vessels (ESVs), based on studies conducted in accordance with [Resolution 909 \(WRC-12\)](#);

1.9 to consider, in accordance with [Resolution 758 \(WRC-12\)](#):

1.9.1 possible new allocations to the fixed-satellite service in the frequency bands 7 150-7 250 MHz (space-to-Earth) and 8 400-8 500 MHz (Earth-to-space), subject to appropriate sharing conditions;

1.9.2 the possibility of allocating the bands 7 375-7 750 MHz and 8 025-8 400 MHz to the maritime-mobile satellite service and additional regulatory measures, depending on the results of appropriate studies;

1.10 to consider spectrum requirements and possible additional spectrum allocations for the mobile-satellite service in the Earth-to-space and space-to-Earth directions, including the satellite component for broadband applications, including International Mobile Telecommunications (IMT), within the frequency range from 22 GHz to 26 GHz, in accordance with [Resolution 234 \(WRC-12\)](#);

1.11 to consider a primary allocation for the Earth exploration-satellite service (Earth-to-space) in the 7-8 GHz range, in accordance with [Resolution 650 \(WRC-12\)](#);

1.12 to consider an extension of the current worldwide allocation to the Earth exploration-satellite (active) service in the frequency band 9 300-9 900 MHz by up to 600 MHz within the frequency bands 8 700-9 300 MHz and/or 9 900-10 500 MHz, in accordance with [Resolution 651 \(WRC-12\)](#);

1.13 to review No. **5.268** with a view to examining the possibility for increasing the 5 km distance limitation and allowing space research service (space-to-space) use for proximity operations by space vehicles communicating with an orbiting manned space vehicle, in accordance with [Resolution 652 \(WRC-12\)](#);

1.14 to consider the feasibility of achieving a continuous reference time-scale, whether by the modification of coordinated universal time (UTC) or some other method, and take appropriate action, in accordance with [Resolution 653 \(WRC-12\)](#);

1.15 to consider spectrum demands for on-board communication stations in the maritime mobile service in accordance with [Resolution 358 \(WRC-12\)](#);

1.16 to consider regulatory provisions and spectrum allocations to enable possible new Automatic Identification System (AIS) technology applications and possible new applications to improve maritime radiocommunication in accordance with [Resolution 360 \(WRC-12\)](#);

1.17 to consider possible spectrum requirements and regulatory actions, including appropriate aeronautical allocations, to support wireless avionics intra-communications (WAIC), in accordance with [Resolution 423 \(WRC-12\)](#);

1.18 to consider a primary allocation to the radiolocation service for automotive applications in the 77.5-78.0 GHz frequency band in accordance with [Resolution 654 \(WRC-12\)](#);

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 the principles contained in Annex 1 to [Resolution 27 \(Rev.WRC-12\)](#);

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, and other options, in response to [Resolution 86 \(Rev. Marrakesh, 2002\)](#) of the Plenipotentiary Conference, an advance publication, coordination, notification and recording procedures for frequency assignments pertaining to satellite networks, in accordance with [Resolution 86 \(Rev.WRC-07\)](#) to facilitate rational, efficient, and economical use of radio frequencies and any associated orbits, including the geostationary-satellite orbit;

8 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 \(Rev.WRC-07\)](#);

9 to consider and approve the Report of the Director of the Radiocommunication Bureau, in accordance with Article 7 of the Convention:

9.1 on the activities of the Radiocommunication Sector since WRC-12;

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

9.3 on action in response to [Resolution 80 \(Rev.WRC-07\)](#);

10 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, in accordance with Article 7 of the Convention,

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

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.

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Note: In the list above, ‘AI’ refers to ‘WRC-15 agenda item’ and ‘PAI’ refers to ‘WRC-18 preliminary agenda item’.

RESOLUTION 807 (WRC-12)

Agenda for the 2015 World Radiocommunication Conference

The World Radiocommunication Conference (Geneva, 2012),

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 that 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 WRC-12 has identified a number of urgent issues requiring further examination by WRC-15;
- b)* that, in preparing this agenda, some 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 2015 for a maximum period of four weeks, with the following agenda:

- 1 on the basis of proposals from administrations, taking account of the results of WRC-12 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 in respect of the following items:

1.1 to consider additional spectrum allocations to the mobile service on a primary basis and identification of additional frequency bands for International Mobile Telecommunications (IMT) and related regulatory provisions, to facilitate the development of terrestrial mobile broadband applications, in accordance with [Resolution 233 \(WRC-12\)](#);

1.2 to examine the results of ITU-R studies, in accordance with [Resolution 232 \(WRC-12\)](#), on the use of the frequency band 694-790 MHz by the mobile, except aeronautical mobile, service in Region 1 and take the appropriate measures;

1.3 to review and revise [Resolution 646 \(Rev.WRC-12\)](#) for broadband public protection and disaster relief (PPDR), in accordance with [Resolution 648 \(WRC-12\)](#);

1.4 to consider possible new allocation to the amateur service on a secondary basis within the band 5 250-5 450 kHz in accordance with [Resolution 649 \(WRC-12\)](#);

1.5 to consider the use of frequency bands allocated to the fixed-satellite service not subject to Appendices **30**, **30A** and **30B** for the control and non-payload communications of unmanned aircraft systems (UAS) in non-segregated airspaces, in accordance with [Resolution 153 \(WRC-12\)](#);

1.6 to consider possible additional primary allocations:

1.6.1 to the fixed-satellite service (Earth-to-space and space-to-Earth) of 250 MHz in the range between 10 GHz and 17 GHz in Region 1;

1.6.2 to the fixed-satellite service (Earth-to-space) of 250 MHz in Region 2 and 300 MHz in Region 3 within the range 13-17 GHz; and review the regulatory provisions on the current allocations to the fixed-satellite service within each range, taking into account the results of ITU-R studies, in accordance with [Resolutions 151 \(WRC-12\)](#) and [152 \(WRC-12\)](#), respectively;

1.7 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-geostationary mobile-satellite systems in the mobile-satellite service) in accordance with [Resolution 114 \(Rev.WRC-12\)](#);

1.8 to review the provisions relating to earth stations located on board vessels (ESVs), based on studies conducted in accordance with [Resolution 909 \(WRC-12\)](#);

1.9 to consider, in accordance with [Resolution 758 \(WRC-12\)](#):

1.9.1 possible new allocations to the fixed-satellite service in the frequency bands 7 150-7 250 MHz (space-to-Earth) and 8 400-8 500 MHz (Earth-to-space), subject to appropriate sharing conditions;

1.9.2 the possibility of allocating the bands 7 375-7 750 MHz and 8 025-8 400 MHz to the maritime-mobile satellite service and additional regulatory measures, depending on the results of appropriate studies;

1.10 to consider spectrum requirements and possible additional spectrum allocations for the mobile-satellite service in the Earth-to-space and space-to-Earth directions, including the satellite component for broadband applications, including International Mobile Telecommunications (IMT), within the frequency range from 22 GHz to 26 GHz, in accordance with [Resolution 234 \(WRC-12\)](#);

1.11 to consider a primary allocation for the Earth exploration-satellite service (Earth-to-space) in the 7-8 GHz range, in accordance with [Resolution 650 \(WRC-12\)](#);

1.12 to consider an extension of the current worldwide allocation to the Earth exploration-satellite (active) service in the frequency band 9 300-9 900 MHz by up to 600 MHz within the frequency bands 8 700-9 300 MHz and/or 9 900-10 500 MHz, in accordance with [Resolution 651 \(WRC-12\)](#);

1.13 to review No. **5.268** with a view to examining the possibility for increasing the 5 km distance limitation and allowing space research service (space-to-space) use for proximity operations by space vehicles communicating with an orbiting manned space vehicle, in accordance with [Resolution 652 \(WRC-12\)](#);

1.14 to consider the feasibility of achieving a continuous reference time-scale, whether by the modification of coordinated universal time (UTC) or some other method, and take appropriate action, in accordance with [Resolution 653 \(WRC-12\)](#);

1.15 to consider spectrum demands for on-board communication stations in the maritime mobile service in accordance with [Resolution 358 \(WRC-12\)](#);

1.16 to consider regulatory provisions and spectrum allocations to enable possible new Automatic Identification System (AIS) technology applications and possible new applications to improve maritime radiocommunication in accordance with [Resolution 360 \(WRC-12\)](#);

1.17 to consider possible spectrum requirements and regulatory actions, including appropriate aeronautical allocations, to support wireless avionics intra-communications (WAIC), in accordance with [Resolution 423 \(WRC-12\)](#);

1.18 to consider a primary allocation to the radiolocation service for automotive applications in the 77.5-78.0 GHz frequency band in accordance with [Resolution 654 \(WRC-12\)](#);

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 the principles contained in Annex 1 to [Resolution 27 \(Rev.WRC-12\)](#);

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, and other options, in response to [Resolution 86 \(Rev. Marrakesh, 2002\)](#) of the Plenipotentiary Conference, an advance publication, coordination, notification and recording procedures for frequency assignments pertaining to satellite networks, in accordance with [Resolution 86 \(Rev.WRC-07\)](#) to facilitate rational, efficient, and economical use of radio frequencies and any associated orbits, including the geostationary-satellite orbit;

8 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 \(Rev.WRC-07\)](#);

9 to consider and approve the Report of the Director of the Radiocommunication Bureau, in accordance with Article 7 of the Convention:

9.1 on the activities of the Radiocommunication Sector since WRC-12;

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

9.3 on action in response to [Resolution 80 \(Rev.WRC-07\)](#);

10 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, in accordance with Article 7 of the Convention,

resolves further

to activate the Conference Preparatory Meeting,

invites the Council

to finalize the agenda and arrange for the convening of WRC-15, 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-15,

instructs the Secretary-General

to communicate this Resolution to international and regional organizations concerned.

RESOLUTION 808 (WRC-12)

Preliminary agenda for the 2018 World Radiocommunication Conference

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that, in accordance with No. 118 of the ITU Convention, the general scope of the agenda for WRC-18 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-18:

- 1 to take appropriate action in respect of those urgent issues that were specifically requested by WRC-15;
- 2 on the basis of proposals from administrations and the Report of the Conference Preparatory Meeting, and taking account of the results of WRC-15, to consider and take appropriate action in respect of the following items:
 - 2.1 to consider regulatory actions, including spectrum allocations, to support GMDSS modernization and implementation of e-navigation in accordance with [Resolution 359 \(WRC-12\)](#);
 - 2.2 to consider the appropriate regulatory procedures for notifying satellite networks needed to facilitate the deployment and operation of nano-satellites and picosatellites, in accordance with [Resolution 757 \(WRC-12\)](#);

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 \(Rev.WRC-12\)](#);

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, and other options, in response to [Resolution 86 \(Rev. Marrakesh, 2002\)](#) of the Plenipotentiary Conference, an advance publication, coordination, notification and recording procedures for frequency assignments pertaining to satellite networks, in accordance with [Resolution 86 \(Rev.WRC-07\)](#) to facilitate the rational, efficient, and economical use of radio frequencies and any associated orbits, including the geostationary-satellite orbit;

9 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 \(Rev.WRC-07\)](#);

10 to consider and approve the Report of the Director of the Radiocommunication Bureau, in accordance with Article 7 of the Convention:

10.1 on the activities of the Radiocommunication Sector since WRC-15;

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

10.3 on action in response to [Resolution 80 \(Rev.WRC-07\)](#);

11 to recommend to the Council items for inclusion in the agenda for the following WRC, in accordance with Article 7 of the Convention,

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-18,

instructs the Secretary-General

to communicate this Resolution to international and regional organizations concerned.

RESOLUTION 11 (WRC-12)

Use of satellite orbital positions and associated frequency spectrum to deliver international public telecommunication services in developing countries

The World Radiocommunication Conference (Geneva, 2012),

considering

a) that Resolution 1721 (XVI) of the United Nations General Assembly sets forth the principle of the availability of satellite communications to the nations of the world on a global basis;

b) that, in the United Nations Millennium Declaration (Resolution A/RES/55/2), the Heads of State and Government expressed their belief that the central challenge faced today is to ensure that globalization becomes a positive force for all the world's people; and further resolved "*to ensure that the benefits of new technologies, especially information and communication technologies ... are available to all*";

c) that United Nations General Assembly Resolution 56/183 endorsed the holding of a World Summit on the Information Society (WSIS);

d) that the first phase of WSIS, held in Geneva in December 2003, adopted a Declaration of Principles and a Plan of Action;

e) that in the Geneva Declaration of Principles it is recognized that: "*A well-developed information and communication network infrastructure and applications, adapted to regional, national and local conditions, easily-accessible and affordable, and making greater use of broadband and other innovative technologies where possible, can accelerate the social and economic progress of countries, and the well-being of all individuals, communities and peoples*";

f) that WSIS recognized the relevance of the regulatory regime and of international, open, interoperable and non-discriminatory standards, and the importance of radio-frequency spectrum management on the basis of the public interest;

g) that the Geneva Plan of Action incorporates actions in order to “*promote the provision of global high-speed satellite services for underserved areas such as remote and sparsely populated areas*”;

h) that the report of the Secretary-General for ECOSOC issued in May 2009 clearly recognized that “*satellite service continues to play a vital role in television broadcasting and in connecting more isolated and rural areas*”¹;

i) that Resolution **15 (Rev.WRC-03)** invites the Council to consider in what way the work of ITU-T, ITU-R and ITU-D and other organs of the Union may be utilized in the most effective way for the information and assistance of administrations of Member States in the development of space radiocommunications;

j) that bridging the digital divide (i.e. reducing the gap between technology-empowered and technology-excluded communities by providing universal access) was one of the main objectives of WSIS;

k) that the Doha Action Plan adopted by the World Telecommunication Development Conference (WTDC-06) recognized that: “*ICTs are essential for political, economic, social and cultural development.*”

1

Economic and Social Council (ECOSOC), Commission on Science and Technology for Development, twelfth session, Geneva, 25-29 May 2009, Report of the Secretary-General. Page 11, http://www.unctad.org/en/docs/ecn162009d2_en.pdf. (Progress made in the implementation of and follow-up to the World Summit on the Information Society outcomes at the regional and international levels - Development-oriented policies for socio-economic inclusive information society, including access, infrastructure and an enabling environment).

They fuel the global information society and are rapidly transforming our lives and promoting better understanding among peoples. They also play an important role in poverty alleviation, job creation, environmental protection and the prevention and mitigation of natural and other disasters”;

l) that the Hyderabad Declaration adopted by the World Telecommunication Development Conference (WTDC-10) notes: “... However, the digital divide remains, and is compounded by disparities in broadband access and infrastructure between and within countries, in particular between urban and rural areas. Rapid development of telecommunication/ICT infrastructure in rural and remote areas, using suitable technologies, is an immediate priority for many countries. Another major concern for many administrations is the lack of infrastructure to support telecommunication/ICT development in rural areas, for which suitable and affordable solutions have to be identified. Broadband access and usage, supported by strong national backbones, are increasingly considered as essential services that need to be universally available to all citizens in order to develop networked economies and information societies”;

m) that Article 44 of the ITU Constitution stipulates that: “In using frequency bands for radio services, Member States shall bear in mind that radio frequencies and any associated orbits, including the geostationary-satellite orbit, are limited natural resources and that they must be used rationally, efficiently and economically, in conformity with the provisions of 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”;

n) that, by Resolution 71 (Rev. Guadalajara 2010) of the Plenipotentiary Conference, ITU adopted its strategic plan for the period 2012-2015, which contains, as one of the strategic goals of ITU-R: “To seek ways and means to ensure rational, equitable, efficient and economical use of the radio-frequency spectrum and satellite-orbit resources and to promote flexibility for future expansion and new technological developments”;

o) that attainment of most of the Millennium Development Goals (MDGs) remains a challenge, particularly in the poorest countries, amid a climate of global economic downturn;

p) that, in its final report (“*A 2010 Leadership Imperative: The Future Built on Broadband*”), the Broadband Commission recognizes that: “*the Internet and other information and communication technologies (ICTs) should be used for the benefit of all mankind*”, and that “*broadband will be the basis for digital invention and innovation and the foundation for digital and other investments that lie at the very heart of our shared knowledge economy and society*”;

q) that UN General Assembly Resolution A/65/65/141 of 20 December 2010 recognizes that “*while in recent years access to information and communications technologies, including the steady increase in Internet access ..., the need remains to reduce the digital divide and to ensure that the benefits of new technologies, especially information and communication technologies are available to all ...*” and “*that information and communications technologies present new opportunities and challenges and that there is a pressing need to address the major impediments that developing countries face in accessing the new technologies, such as insufficient resources, infrastructure, ...*”;

considering further

the need to assist developing countries in using satellite telecommunications to enable sustainable and affordable access to information and telecommunication services,

recognizing

a) that the introduction of competition into the international satellite telecommunication sector has led to an increase in the availability of diverse and innovative international telecommunication services in both developed and developing countries, including the availability of essential public services such as disaster relief and e-government;

- b) the growing availability of mobile and fixed broadband communications in the developing world and the innovative and economically beneficial uses to which they are being put;
- c) that governments and international and regional intergovernmental organizations are fostering innovation, affordability and broader availability of satellite services through ITU registration and deployment of their own satellite systems;
- d) that broadband technologies, as a means of supporting vital telecommunication applications, should be accessible to everyone without discrimination;
- e) that broadband satellite technologies contribute to reducing the digital (broadband) divide through the provision of telecommunication services, and that the expansion of broadband satellite services is generating growth in the developing countries through e-applications, such as e-health, e-learning, e-government, teleworking and residential and community Internet access, which can be used as a rapid and efficient tool for achieving each country's ICT policy objectives;
- f) that efficient use of the orbital resource and associated frequency spectrum helps both to ensure global coverage and to connect countries directly, instantly and reliably at an affordable price,

reaffirms

- a) the important role played by international public telecommunication services by satellite in ensuring fulfilment of the MDGs;
- b) ITU's role in international management of the radio-frequency spectrum and satellite orbit resource;
- c) the international rights and obligations of all administrations in respect of their own and other administrations' frequency assignments;
- d) that ITU satellite coordination and notification procedures specified in the Radio Regulations are used to obtain international recognition and protection for satellite network operations,

noting

a) that Programme 1 of the Telecommunication Development Bureau (BDT) on information and communication infrastructure and technology development, provides assistance to developing countries in the area of spectrum management and in the efficient and cost-effective development of rural, national and international broadband telecommunication networks, including by satellite;

b) the activities of the ITU-D Study Groups in preparing materials to assist developing countries in the areas of spectrum management, broadband access technologies, and telecommunications/ICTs for rural and remote areas and disaster management,

resolves

1 that ITU-R continue to collaborate with, and provide information when requested by, ITU-D, on satellite technologies and applications as defined in ITU-R Recommendations and Reports and on satellite regulatory procedures in the Radio Regulations that will help developing countries with development and implementation of satellite networks and services;

2 that ITU-R undertakes studies to determine whether it might be necessary to apply additional regulatory measures to enhance the availability of public international telecommunication services delivered through satellite technology,

instructs the Director of the Radiocommunication Bureau

1 to ensure that ITU-R collaborates with ITU-D in the implementation of this resolution;

2 to report the results of these studies to the next world radiocommunication conference,

invites the Director of the Telecommunication Development Bureau

1 to organize workshops, seminars and training courses that specifically address sustainable and affordable access to satellite telecommunications, including broadband, and to initiate activities or studies between the relevant study groups of ITU-D and ITU-R that will assist developing countries in building capacities in the development and use of satellite telecommunications;

2 to bring this resolution to the attention of the World Telecommunication Development Conference,

invites Member States and Sector Members

to contribute to the implementation of this resolution,

instructs the Secretary-General

to bring this Resolution to the attention of the International Telecommunication Satellite Organization (ITSO) and the International Mobile Satellite Organization (IMSO).

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-12)

Use of incorporation by reference in the Radio Regulations

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that the principles of incorporation by reference were adopted by WRC-95 and revised by subsequent conferences (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, and a cross-reference list of the regulatory provisions, including footnotes and Resolutions, incorporating such ITU-R Recommendations by reference, 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-12)

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, and a cross-reference list of the regulatory provisions, including footnotes and Resolutions, incorporating such ITU-R Recommendations by reference, shall be developed and maintained by the committees. These lists 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;

^{*} *Note by the Secretariat:* This Resolution was revised by WRC-07.

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

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 67 (WRC-12)

Updating and rearrangement of the Radio Regulations

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that the radio spectrum is a finite resource, and there is continuing evolution and demand for frequency requirements and an increasing multiplicity of radiocommunication applications;
- b) that the Radio Regulations are founded on the principles outlined in their Preamble;
- c) that subsequent to the ITU reorganization at APP-92, several attempts have been made to review, simplify and update the Radio Regulations;
- d) that the majority of agenda items for past WRCs concern frequency allocations, currently contained in Article 5 and associated regulations;
- e) that 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, without affecting other administrations;
- b) that the studies for review to simplify the Radio Regulations may take more than one study cycle,

noting

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

b) that ITU-R Recommendations incorporated by reference as they would appear in Volume IV of the Radio Regulations may be limited to a list of titles and their cross-references in the Radio Regulations,

resolves to invite ITU-R

1 to initiate studies for possible updating, review and possible revision of outdated information, and rearrangement of certain parts of the Radio Regulations, except for Articles **1, 4, 5, 6, 7, 8, 9, 11, 13, 14, 15, 16, 17, 18, 21, 22, 23** and **59** and those parts which are being revised on a regular basis, as appropriate,

2 to submit the results of these studies for consideration by a future world radiocommunication conference in accordance with this Resolution,

invites ITU-R members

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

instructs the Director of the Radiocommunication Bureau

to report the status of the studies to WRC-15.

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-2000¹, 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;

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

- 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;
- 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-03², concepts to satisfy *resolves 2* of Resolution **80 (WRC-2000)** were provided, as follows:

- special measures for countries submitting their first satellite filing:

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

- 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;
 - 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 radio-communication 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.

(Minneapolis, 1998) – (Rev. Marrakesh, 2002)

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-12)

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, 2012),

considering

- a) the current allocation of the frequency band 5 000-5 250 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 priority 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 5 030-5 150 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 5 091-5 150 MHz for the MLS if its requirements cannot be satisfied in the frequency band 5 030-5 091 MHz;
- c) that the FSS providing feeder links for non-GSO systems in the MSS will need access to the frequency band 5 091-5 150 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 5 091-5 150 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 5 091-5 150 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 5 091-5 150 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 151 (WRC-12)

Additional primary allocations to the fixed-satellite service in frequency bands between 10 and 17 GHz in Region 1

The World Radiocommunication Conference (Geneva, 2012),

considering

a) that the existing unplanned bands for the fixed-satellite service (FSS) in the 10-15 GHz range are extensively used for a large variety of applications, and these applications have triggered a rapid rise in the demand for this frequency range;

b) that, in ITU Region 3, the spectrum allocated to the unplanned FSS in the Earth-to-space and space-to-Earth directions in the 10-15 GHz band is 750 MHz and 1.05 GHz, respectively;

c) that, in ITU Region 2, the spectrum allocated to the unplanned FSS in the Earth-to-space and space-to-Earth directions in the 10-15 GHz band is 750 MHz and 1.0 GHz, respectively;

d) that WRC-12 adopted [Resolution 152 \(WRC-12\)](#) to consider possible additional primary allocations to the fixed-satellite service (Earth-to-space) of 250 MHz in Region 2 and 300 MHz in Region 3;

e) that, in ITU Region 1, the spectrum allocated to the unplanned FSS in the Earth-to-space and space-to-Earth directions in the 10-15 GHz band is 750 MHz and 750 MHz, respectively;

f) that the existing difference of capacity in ITU Regions 2 and 3 and in ITU Region 1 will increase after implementation of *considering d)* and create an imbalance among these Regions, thus restricting satellite operators in different ITU Regions from fully and effectively utilizing the limited frequency resource to cope with the increasing spectrum demand in *considering a)*;

g) that there is a need to resolve the shortage of spectrum in Region 1 and Regions 2 and 3 in *considering b) to e)*, such that the rapid growth of spectrum demand in *considering a)* could be met and the limited spectrum resources could be used in an efficient and economical way in accordance with the principle of Article 44 of the ITU Constitution;

h) that frequency allocation should, wherever possible, allocate frequency bands on a worldwide basis (aligned services, categories of service and frequency band limits), taking into account safety, technical, operational, economic and other relevant factors,

recognizing

a) that studies will be required in order to develop regulatory changes, including additional allocations to the fixed-satellite service, to meet the growing spectrum requirements;

b) that it is important to ensure the FSS systems do not cause undue constraints to existing primary services having allocations in the band 10-17 GHz;

c) that there are assignments in the 14.5-14.8 GHz band in the Regions 1 and 3 BSS feeder-link Plan, contained in Appendix **30A**, for 22 countries in Africa, Middle East and Asia-Pacific;

d) that new assignments could be added to the Appendix **30A** List of assignments for Regions 1 and 3 following the successful application of Article 4 of Appendix **30A**;

e) that there are FSS (Earth-to-space) allotments and assignments in the Appendix **30B** Plan and List in the frequency band 12.75-13.25 GHz;

f) that the above-mentioned Appendix **30B** List in the Earth-to-space direction could be further developed using the procedures of Articles 6 and 7 of Appendix **30B**;

g) that there are assignments in the 11.7-12.5 GHz band in the Regions 1 and 3 BSS Plan, contained in Appendix **30**;

h) that transmitting or receiving earth stations, as the case may be, of these above-mentioned allotments or assignments in the Plans or the Lists could be located at any point within the service area of their associated satellite network,

further recognizing

a) that the 13.25-13.75 GHz band is allocated to the Earth exploration-satellite service (active) on a primary basis;

b) that EESS (active) satellites with three types of active sensor in 13.25-13.75 GHz –scatterometers, altimeters and precipitation radars – have been operating in this band for many years. The remote sensing systems of EESS (active) are used in backscatter echo mode to monitor weather, water and climate change and similar emergencies, with the aim of preventing natural disasters, which could suffer from interference resulting from FSS (uplink);

c) that, although EESS (active) satellites are currently operated by only a limited number of countries, measurements are performed worldwide and the remote sensing data and related analyses are distributed and used globally, and are performed for the benefit of the whole international community;

d) that the EESS (active) systems are crucial for the protection of human life and natural resources. It is necessary to ensure that the EESS (active) systems shall be protected without any undue constraints to their operations in the 13.25-13.75 GHz band;

e) that the 15.35-15.4 GHz band, in which No. **5.340** applies, is allocated to Earth exploration-satellite (passive), space research (passive) and radio astronomy services;

f) that the 13.75-14 GHz band is allocated to the fixed-satellite service and the radiolocation service on a primary basis, that the Earth exploration-satellite (passive), space research (passive) and standard frequency and time signal-satellite (Earth-to-space) services are allocated on a secondary basis, and that Nos. **5.502** and **5.503** and Resolution **144 (Rev.WRC-07)** apply in this band,

resolves

1 to complete, for WRC-15:

- i) studies of possible bands for a new primary allocation to the fixed-satellite service of 250 MHz in both directions in Region 1 within the bands 10-17 GHz, with particular focus on the frequency range that is contiguous (or near contiguous) to the existing fixed-satellite service allocations, taking into account sharing and compatibility studies, while protecting the existing primary services in the band(s);
- ii) studies that include consideration of utilizing existing allocations to the fixed-satellite service in both directions through a review of regulatory provisions, except for Nos. **5.502** and **5.503** and Resolution **144 (Rev.WRC-07)**, taking into account sharing and compatibility studies, while protecting the existing primary services in the band 10-17 GHz;

2 that if consideration is given to use of the 14.5-14.8 GHz band, appropriate measures need to be taken with regard to the Appendix **30A** Plan and List, as the case may be, to ensure the integrity and adequate protection of these bands, specifically taking into account:

- i) required coordination procedures between Appendix **30A** networks, as the case may be, and the new fixed-satellite service utilization of the bands;
- ii) the need for transmitting earth stations in the Appendix **30A** Plan and List to be able to be located anywhere within their respective service areas;
- iii) the need to appropriately protect assignments in the Appendix **30A** Plan and List, as the case may be, from any new fixed-satellite service utilization of the bands;

3 that the 11.7-12.5 GHz band should be excluded from consideration; however, if consideration is given to use of the 11.7-12.5 GHz band in Region 1, appropriate measures need to be taken with regard to the Appendix **30** Plans and List, according to the case, to ensure the integrity and full protection of these bands, specifically taking into account:

- i) required coordination procedures between Appendix **30** networks, as the case may be, and the new fixed-satellite service utilization of the bands;

- ii) the need for receiving earth stations in the Appendix 30 Plans and List to be able to be located anywhere within their respective service areas;
- iii) the need to appropriately protect assignments in the Appendix 30 Plans and List, as the case may be, from any new fixed-satellite service utilization of the bands;

4 that the 12.75-13.25 GHz band shall be excluded from the studies referred to in this Resolution;

5 that WRC-15 consider the results of the above studies and take appropriate action,

invites ITU-R

to conduct studies, as a matter of urgency, on technical (including necessary calculations and criteria), operational and regulatory issues on this topic, taking into account *resolves* 1, 2, 3 and 4, in time for WRC-15 to consider the results of these studies and take appropriate action,

invites administrations

to participate in the ITU-R studies through the submission of contributions.

RESOLUTION 152 (WRC-12)

Additional primary allocations to the fixed-satellite service in the Earth-to-space direction in frequency bands between 13-17 GHz in Region 2 and Region 3

The World Radiocommunication Conference (Geneva, 2012),

considering

a) that the existing unplanned bands for the fixed-satellite service (FSS) in the 10-15 GHz range are extensively used for a large variety of applications, and these applications, have triggered a rapid rise in the demand for this frequency range;

b) that, in ITU Region 3, the spectrum allocated to the unplanned FSS in the Earth-to-space and space-to-Earth directions in the 10-15 GHz band is 750 MHz and 1.05 GHz, respectively;

c) that, in ITU Region 2, the spectrum allocated to the unplanned FSS in the Earth-to-space and space-to-Earth directions in the 10-15 GHz band is 750 MHz and 1.0 GHz, respectively;

d) that the difference of capacity in *considering b)* and *c)* creates bandwidth limitation in the Earth-to-space direction and therefore restricts satellite operators from fully and effectively utilizing the limited frequency resource to cope with the increasing spectrum demand in *considering a)*;

e) that there is a need to resolve the shortage of spectrum in the Earth-to-space direction as described in *considering b)* and *c)*, such that the rapid growth of spectrum demand in *considering a)* could be met and the limited spectrum resources could be used in an efficient and economical way in accordance with the principle of Article 44 of the ITU Constitution;

f) that additional primary allocations to the unplanned FSS in the Earth-to-space direction that are contiguous (or near contiguous) to the existing allocations are necessary in order to solve the spectrum insufficiency issue in *considering b)* and *c)*;

g) that frequency allocation should, wherever possible, allocate frequency bands on a worldwide basis (aligned services, categories of service and frequency band limits), taking into account safety, technical, operational, economic and other relevant factors,

recognizing

a) that it is important to ensure the FSS systems do not cause undue constraints to existing primary services having allocations in the band 13-17 GHz;

b) that there are assignments in the 14.5-14.8 GHz band in the Regions 1 and 3 BSS feeder-link Plan, contained in Appendix **30A**, for 22 countries in Africa, Middle East and Asia-Pacific;

c) that new assignments could be added to the Appendix **30A** List of assignments for Regions 1 and 3 following the successful application of Article 4 of Appendix **30A**;

d) that there are FSS (Earth-to-space) allotments and assignments in the Appendix **30B** Plan and List in the frequency band 12.75-13.25 GHz;

e) that the above-mentioned Appendix **30B** List in the Earth-to-space direction could be further developed using the procedures of Articles 6 and 7 of Appendix **30B**;

f) that transmitting earth stations of these above-mentioned allotments or assignments in the Plans or Lists, as the case may be, could be located at any point within the service area of its associated satellite network,

further recognizing

a) that the 13.25-13.75 GHz band has been allocated to the Earth exploration-satellite service (active) on a primary basis;

b) that EESS (active) satellites with three types of active sensor in 13.25-13.75 GHz –scatterometers, altimeters and precipitation radars – have been operating in this band for many years. The remote sensing systems of EESS (active) are used in backscatter echomode to monitor weather, water and climate change and similar emergencies, with the aim of preventing natural disasters, which could suffer from interference resulting from FSS (uplink);

c) that, although EESS (active) satellites are currently operated by only a limited number of countries, measurements are performed worldwide and the remote sensing data and related analyses are distributed and used globally, and are performed for the benefit of the whole international community;

d) that the EESS (active) systems are crucial for the protection of human life and natural resources. It is necessary to ensure that the EESS (active) systems shall be protected without any undue constraints to their operations in the 13.25-13.75 GHz band;

e) that the 15.35-15.4 GHz band, in which No. **5.340** applies, is allocated to Earth exploration-satellite (passive), space research (passive) and radio astronomy services;

f) that the 13.75-14 GHz band is allocated to the fixed-satellite service and the radiolocation service on a primary basis, that the Earth exploration-satellite (passive), space research (passive) and standard frequency and time signal-satellite (Earth-to-space) services are allocated on a secondary basis, and that Nos. **5.502** and **5.503** and Resolution **144 (Rev.WRC-07)** apply in this band,

resolves

1 to complete, for WRC-15:

i) studies of possible bands for a new primary allocation to the fixed-satellite service in the Earth-to-space direction of 250 MHz in Region 2 and 300 MHz in Region 3 within the bands 13-17 GHz, with particular

focus on the frequency range that is contiguous (or near contiguous) to the existing fixed-satellite service allocations, taking into account sharing and compatibility studies, while protecting the existing primary services in the band(s);

- ii) studies that include consideration of utilizing existing allocations to the fixed-satellite service in the Earth-to-space direction through a review of regulatory provisions, except for Nos. **5.502** and **5.503** and Resolution **144 (Rev.WRC-07)**, taking into account sharing and compatibility studies, while protecting the existing primary services in the band(s);

2 that if consideration is given to use of the 14.5-14.8 GHz band, appropriate measures need to be taken with regard to the Appendix **30A** Plan and List, as the case may be, to ensure the integrity and full protection of these bands, specifically taking into account:

- i) required coordination procedures between Appendix **30A** networks, as the case may be, and the new fixed-satellite service utilization of the bands;
- ii) the need for transmitting earth stations in the Appendix **30A** Plan and List to be able to be located anywhere within their respective service areas;
- iii) the need to appropriately protect assignments in the Appendix **30A** Plan and List, as the case may be, from any new fixed-satellite service utilization of the bands;

3 that the 13-13.25 GHz band shall be excluded from the studies referred to in this Resolution;

4 that WRC-15 consider the results of the above studies and take appropriate action,

invites ITU-R

1 to conduct studies, as a matter of urgency, on technical (including necessary calculations and criteria), operational and regulatory issues on this topic, taking into account *resolves* 1, 2, 3 and 4, in time for WRC-15 to consider the results of these studies and take appropriate action;

2 to consider appropriate measures regarding the use of provisional recording in respect of coordination between assignments in the Appendix **30A** Plan and List in the band 14.5-14.8 GHz and the new fixed-satellite service utilization,

invites administrations

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

RESOLUTION 153 (WRC-12)

The use of frequency bands allocated to the fixed-satellite service not subject to Appendices 30, 30A and 30B for the control and non-payload communications of unmanned aircraft systems in non-segregated airspaces

The World Radiocommunication Conference (Geneva, 2012),

considering

- a)* that many applications of unmanned aircraft systems (UAS) exist that require access to non-segregated airspace;
- b)* that unmanned aircraft (UA) need to operate seamlessly with manned aircraft in the non-segregated airspace and, to the extent practicable, use globally harmonized spectrum;
- 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, also referred to as control and non-payload communications (CNPC);
- d)* that UAS CNPC links via satellite are part of UAS operations, in particular to relay transmissions beyond the horizon and maintain safe flight operation;
- e)* that UAS already operate in fixed-satellite service (FSS) frequency bands for the UA-to-satellite CNPC links under No. 4.4 of the Radio Regulations;
- f)* that the use of FSS for the UAS CNPC links, including but not limited to the links between geostationary satellite and mobile elements of the UAS, has to ensure the protection of incumbent services;

g) that CNPC links will need the ability to operationally mitigate interference in order to ensure appropriate overall link integrity and availability that are consistent with UAS operations in non-segregated airspace;

h) that multi-frequency CNPC architectures provide a means of improving link availabilities, and have the potential to mitigate interference;

i) that it is necessary to take into account existing and future satellite networks when planning for growth of the use of FSS resources for UAS;

j) that appropriate Article 11 notification status of a FSS network is required for use in high-reliability applications such as UAS CNPC links,

recognizing

a) that, with the introduction of UA in non-segregated airspace, continued safety of other airspace users as well as life and property on the ground needs to be maintained;

b) that studies are required to provide a basis for considering regulatory, technical and operational conditions, in order to use FSS links for the CNPC link between geostationary satellites and UAS in non-segregated airspaces in a compatible manner with incumbent services in the FSS frequency bands;

c) that, in accordance with the Convention on International Civil Aviation, the operation of UAS in non-segregated airspace has to meet standards and recommended practices;

d) that ITU-R reports have been approved dealing with UAS operation in non-segregated airspace, in particular Report ITU-R M.2171 and Report ITU-R M.2233;

e) that, pursuant to No. **4.10** of the Radio Regulations, Member States 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,

resolves to invite WRC-15

to consider, based on the results of the ITU-R studies referred to in *invites ITU-R* below, the possible regulatory actions to support the use of FSS frequency bands for the UAS CNPC links, as mentioned in the *considerings* above, ensuring the safe operation of UAS CNPC links, consistent with *recognizing e*),

invites ITU-R

1 to conduct, in time for WRC-15, the necessary studies leading to technical, regulatory and operational recommendations to the Conference, enabling that Conference to decide on the usage of FSS for the CNPC links for the operation of UAS;

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

3 to take into account information from operations referred to in *considering e*),

further invites

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

instructs the Secretary-General

to bring this Resolution to the attention of ICAO.

RESOLUTION 154 (WRC-12)

Consideration of technical and regulatory actions in order to support existing and future operation of fixed-satellite service earth stations within the band 3 400-4 200 MHz, as an aid to the safe operation of aircraft and reliable distribution of meteorological information in some countries in Region 1

The World Radiocommunication Conference (Geneva, 2012),

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)* where an adequate terrestrial communication infrastructure is not available, fixed-satellite service (FSS) earth stations are the only viable option to augment the communication infrastructure in order to satisfy the overall communications infrastructure requirements of the International Civil Aviation Organization (ICAO) and to ensure distribution of meteorological information under the auspices of the World Meteorological Organization (WMO);
- d)* that the use of FSS earth stations deployed in some countries in Region 1 for aeronautical communications has the potential to significantly enhance communications between air traffic control centres as well as with remote aeronautical stations,

noting

- a)* that the FSS is not a safety service;
- b)* that, by its Resolution **20 (Rev.WRC-03)**, WRC resolved to instruct the Secretary-General “to encourage ICAO to continue its assistance to developing countries which are endeavouring to improve their aeronautical telecommunications ...”;

c) Recommendation ITU-R SF.1486 on sharing methodology between fixed wireless access systems in the fixed service (FS) and very small aperture terminals (VSATs) in the FSS in the 3 400-3 700 MHz band;

d) Report ITU-R S.2199 on studies on compatibility of broadband wireless access systems and FSS networks in the 3 400-4 200 MHz band;

e) Report ITU-R M.2109 on sharing studies between International Mobile Telecommunications-Advanced (IMT-Advanced) systems and geostationary-satellite networks in the fixed-satellite service in the 3 400-4 200 MHz and 4 500-4 800 MHz frequency bands,

resolves to invite ITU-R

to study possible technical and regulatory measures in some countries in Region 1 to support the existing and future FSS earth stations in the 3 400-4 200 MHz band used for satellite communications related to safe operation of aircraft and reliable distribution of meteorological information referred to in *considering c)*,

invites

all members of the Radiocommunication Sector, ICAO and WMO to contribute to these studies,

instructs the Director of the Radiocommunication Bureau

to include the results of these studies in his Report to WRC-15 for the purposes of considering adequate actions in response to *resolves to invite ITU-R* above,

instructs the Secretary-General

to bring this Resolution to the attention of ICAO and WMO.

RESOLUTION 205 (Rev.WRC-12)

Protection of the systems operating in the mobile-satellite service in the band 406-406.1 MHz

The World Radiocommunication Conference (Geneva, 2012),

considering

- a)* that WARC-79 allocated the band 406-406.1 MHz to the mobile-satellite service in the Earth-to-space direction;
- b)* that No. **5.266** limits the use of the band 406-406.1 MHz to low-power satellite emergency position-indicating radiobeacons (EPIRBs);
- c)* that WARC Mob-83 made provision in the Radio Regulations for the introduction and development of a global distress and safety system;
- d)* that the use of satellite EPIRBs is an essential element of this system;
- e)* that, like any frequency band reserved for a distress and safety system, the band 406-406.1 MHz is entitled to full protection against all harmful interference;
- f)* that Nos. **5.267** and **4.22** and Appendix **15** (Table **15-2**) require the protection of the mobile-satellite service (MSS) within the frequency band 406-406.1 MHz from all emissions of systems, including systems operating in the lower adjacent bands (390-406 MHz) and in the upper adjacent bands (406.1-420 MHz);
- g)* that Recommendation ITU-R M.1478 provides protection requirements for the various types of instruments mounted on board operational satellites receiving EPIRB signals in the frequency band 406-406.1 MHz against both broadband out-of-band emissions and narrowband spurious emissions;
- h)* that studies are needed to adequately address the consequence of aggregate emissions from a large number of transmitters operating in

adjacent bands and the consequent risk to space receivers intended to detect low-power distress-beacon transmissions,

considering further

- a) that some administrations have initially developed and implemented an operational low-altitude, near-polar orbiting satellite system (Cospas-Sarsat) operating in the frequency band 406-406.1 MHz to provide alerting and to aid in the locating of distress incidents;
- b) that thousands of human lives have been saved through the use of spaceborne distress-beacon detection instruments, initially on 121.5 MHz and 243 MHz, and subsequently in the frequency band 406-406.1 MHz;
- c) that the 406 MHz distress transmissions are relayed through many instruments mounted on geostationary, low-Earth and medium-Earth satellite orbits;
- d) that the digital processing of these emissions provides accurate, timely and reliable distress alert and location data to help search and rescue authorities assist persons in distress;
- e) that the International Maritime Organization (IMO) has decided that satellite EPIRBs operating in the Cospas-Sarsat system form part of the Global Maritime Distress and Safety System (GMDSS);
- f) that observations of the use of frequencies in the band 406-406.1 MHz show that they are being used by stations other than those authorized by No. **5.266**, and that these stations have caused harmful interference to the mobile-satellite service, and particularly to the reception of satellite EPIRB signals by the Cospas-Sarsat system,

recognizing

- a) that it is essential for the protection of human life and property that bands allocated exclusively to a service for distress and safety purposes be kept free from harmful interference;

b) that the deployment of mobile systems near the frequency band 406-406.1 MHz is currently envisaged in many countries;

c) that this deployment raises significant concerns on the reliability of future distress and safety communications since the global monitoring of the 406 MHz search and rescue system already shows a high level of noise measured in many areas of the world for the frequency band 406-406.1 MHz;

d) that it is essential to preserve the MSS frequency band 406-406.1 MHz free from out-of-band emissions that would degrade the operation of the 406 MHz satellite transponders and receivers, with the risk that satellite EPIRB signals would go undetected,

noting

a) that the 406 MHz search and rescue system will be enhanced by placing 406-406.1 MHz transponders on global navigation satellite systems;

b) that this enhanced constellation of spaceborne search and rescue instruments will improve geographic coverage and reduce distress-alert transmission delays because of larger uplink footprints and an increased number of satellites;

c) that the characteristics of these spacecraft with larger footprints, and the low power available from satellite EPIRB transmitters, means that aggregate levels of electromagnetic noise, including noise from transmissions in adjacent bands, may present a risk of satellite EPIRB transmissions being undetected, or delayed in reception, thereby putting lives at risk,

resolves to invite ITU-R

1 to conduct, and complete in time for WRC-15, the appropriate regulatory, technical and operational studies with a view to ensuring the adequate protection of MSS systems in the frequency band 406-406.1 MHz

from any emissions that could cause harmful interference (see No. **5.267**), taking into account the current and future deployment of services in adjacent bands as noted in *considering f*);

2 to consider whether there is a need for regulatory action, based on the studies carried out under *resolves 1*, to facilitate the protection of MSS systems in the frequency band 406-406.1 MHz, or whether it is sufficient to include the results of the above studies in appropriate ITU-R Recommendations and/or Reports,

instructs the Director of the Radiocommunication Bureau

1 to include the results of these studies in his Report to WRC-15 for the purposes of considering adequate actions in response to *resolves to invite ITU-R* above;

2 to organize monitoring programmes in the frequency band 406-406.1 MHz in order to identify the source of any unauthorized emission in that band,

urges administrations

1 to take part in monitoring programmes requested by the Bureau in accordance with No. **16.5**, in the frequency band 406-406.1 MHz, with a view to identifying and locating stations of services other than those authorized in the band;

2 to ensure that stations other than those operated under No. **5.266** abstain from using frequencies in the frequency band 406-406.1 MHz;

3 to take the appropriate measures to eliminate harmful interference caused to the distress and safety system;

4 to work with participating countries of the system and ITU to resolve reported cases of interference to the Cospas-Sarsat system;

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

RESOLUTION 232 (WRC-12)

Use of the frequency band 694-790 MHz by the mobile, except aeronautical mobile, service in Region 1 and related studies

The World Radiocommunication Conference (Geneva, 2012),

considering

- a)* that IMT systems are intended to provide telecommunication services on a worldwide scale, regardless of location, network or terminal used;
- b)* that some administrations are planning to use the band 694-862 MHz, or part of that band, for IMT;
- c)* 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 in the Islamic Republic of Iran in Region 3;
- d)* that the band 645-862 MHz is allocated on a primary basis to the aeronautical radionavigation service in the countries listed in No. **5.312**;
- e)* that cellular mobile systems in the three Regions in the bands below 1 GHz operate using various channelling arrangements;
- f)* that where cost considerations warrant the installation of fewer base stations, such as in rural and/or sparsely populated areas, bands below 1 GHz are generally suitable for implementing mobile systems including IMT;
- g)* that bands below 1 GHz are important, especially for some developing countries and countries with large areas where economic solutions for low population density areas are necessary,

noting

- a) that, as a result of the transition from analogue to digital terrestrial television broadcasting, some countries are planning to make, or are making, the band 694-862 MHz, or parts of that band, available for applications in the mobile service;
- b) that the transition from analogue to digital television shall end on 17 June 2015 at 0001 hours UTC according to Article 12.6 of the GE06 Agreement;
- c) that the transition from analogue to digital television is expected to result in situations where parts or all of the band 470-806/862 MHz will be used extensively for both analogue and digital terrestrial transmissions, and that the demand for spectrum during the transition period may be even greater than the stand-alone usage of analogue broadcasting systems;
- d) that Recommendation ITU-R M.819 describes the objectives to be met by IMT in order to meet the needs of developing countries, and in order to assist them to “bridge the gap” between their communication capabilities and those of developed countries;
- e) that Recommendation ITU-R M.1645 also describes the coverage objectives of IMT;
- f) that WRC-12 has approved [Resolution 233 \(WRC-12\)](#) which includes studies to be carried out by ITU-R in time for WRC-15,

recognizing

- a) that there is a need, in many developing countries and countries with large areas of low population density, for the cost-effective implementation of IMT, and that the propagation characteristics of frequency bands below 1 GHz identified in Nos. **5.286AA** and **5.317A** result in larger cells;
- b) that some countries also plan to use the band 470-862 MHz for HDTV and other higher definition modes;

- c) that in Region 1, in accordance with No. **5.296**, a number of countries have deployments of applications ancillary to broadcasting operating on a secondary basis, which provide tools for the daily content production for the broadcast service;
- d) that the GE06 Agreement contains provisions for the terrestrial broadcasting service and other primary terrestrial services, a Plan for digital television, and a list of stations of other primary terrestrial services;
- e) that the time-frame and transition period for the analogue to digital television switchover may not be the same for all countries;
- f) that there is a need for countries to assess the consequences of a new allocation for the mobile service below 790 MHz on the equitable access to spectrum in the GE06 Plan,

resolves

- 1 to allocate the frequency band 694-790 MHz in Region 1 to the mobile, except aeronautical mobile, service on a co-primary basis with other services to which this band is allocated on a primary basis and to identify it for IMT;
- 2 that the allocation in *resolves* 1 is effective immediately after WRC-15;
- 3 that use of the allocation in *resolves* 1 is subject to agreement obtained under No. **9.21** with respect to the aeronautical radionavigation service in countries listed in No. **5.312**;
- 4 that the lower edge of the allocation is subject to refinement at WRC-15, taking into account the ITU-R studies referred to in *invites ITU-R* below and the needs of countries in Region 1, in particular developing countries;
- 5 that WRC-15 will specify the technical and regulatory conditions applicable to the mobile service allocation referred to in *resolves* 1, taking into account the ITU-R studies referred to in *invites ITU-R* below,

invites ITU-R

1 to study the spectrum requirement for the mobile service and for the broadcasting service in this frequency band, in order to determine as early as possible the options for the lower edge referred to in *resolves 4*;

2 to study the channelling arrangements for the mobile service, adapted to the frequency band below 790 MHz, taking into account:

- the existing arrangements in Region 1 in the bands between 790 and 862 MHz and defined in the last version of Recommendation ITU-R M.1036, in order to ensure coexistence with the networks operated in the new allocation and the operational networks in the band 790-862 MHz;
- the desire for harmonization with arrangements across all Regions;
- the compatibility with other primary services to which the band is allocated, including in adjacent bands;

3 to study coexistence between the different channelling arrangements which have been implemented in Region 1 above 790 MHz, as well as the possibility of further harmonization;

4 to study the compatibility between the mobile service and other services currently allocated in the frequency band 694-790 MHz and develop ITU-R Recommendations or Reports;

5 to study solutions for accommodating applications ancillary to broadcasting requirements;

6 to report, in time for WRC-15, the results of these studies,

invites the Director of the Radiocommunication Bureau

to work, in cooperation with the Director of the Telecommunication Development Bureau, to bring assistance to developing countries wishing to implement the new mobile allocation in order to help these administrations to determine the modifications of the Geneva-06 Plan necessary to keep sufficient capacity for broadcasting,

invites administrations

to participate in these studies and to indicate as quickly as possible, in the process of preparation for WRC-15, the spectrum requirement for the mobile service, the broadcasting service and the other services, in order to determine the options for the frequency band to be allocated to the mobile service, as well as the related channelling arrangements.

RESOLUTION 233 (WRC-12)

Studies on frequency-related matters on International Mobile Telecommunications and other terrestrial mobile broadband applications

The World Radiocommunication Conference (Geneva, 2012),

considering

- a)* that since WRC-07 there has been tremendous growth in the demand for mobile broadband applications with multimedia capabilities;
- b)* that International Mobile Telecommunications (IMT) systems have been the main method of delivering wide area mobile broadband applications;
- c)* that IMT and other mobile broadband systems contribute to global economic and social development by providing a wide range of multimedia applications, such as mobile telemedicine, teleworking, distance learning and other applications;
- d)* that in all countries where IMT systems are deployed there is a continuing significant growth in the number of users of IMT systems and in the quantity and rate of data carried, the latter being driven to a large extent by audiovisual content;
- e)* that IMT and other mobile broadband systems could help reduce the digital divide between urban and rural areas, including underserved communities;
- f)* that in many developing markets the main delivery mechanism for broadband access is expected to be through mobile devices;
- g)* that other radiocommunication systems, such as radio local area networks (RLANs), support a wide range of mobile broadband applications;

- h)* that adequate and timely availability of spectrum and supporting regulatory provisions is essential to support future growth of IMT and other mobile broadband systems;
- i)* that there is a need to continually take advantage of technological developments in order to increase the efficient use of spectrum and facilitate spectrum access;
- j)* that harmonized worldwide bands and harmonized frequency arrangements for IMT and other mobile broadband systems are highly desirable in order to achieve global roaming and the benefits of economies of scale;
- k)* that many countries have not yet made available spectrum already identified in the Radio Regulations for IMT, for various reasons, including the use of this spectrum by other systems and services;
- l)* that proximity to bands already identified for IMT may lead to reduced complexity in equipment design;
- m)* the need to protect existing services when considering frequency bands for possible additional allocations to any service;
- n)* that frequency-related matters for IMT in certain frequency bands below 6 GHz were studied in preparation for WRC-07, and WRC-07 decided upon technical conditions and regulatory procedures in some of these bands;
- o)* Report ITU-R M.2109, on sharing studies between IMT-Advanced systems and geostationary-satellite networks in the fixed-satellite service in the 3 400-4 200 and 4 500-4 800 MHz frequency bands;
- p)* Report ITU-R M.2110, on sharing studies between radiocommunication services and IMT systems operating in the 450-470 MHz band;

q) Report ITU-R M.2111, on sharing studies between IMT-Advanced and the radiolocation service in the 3 400-3 700 MHz bands;

r) Report ITU-R M.2112, on compatibility/sharing of airport surveillance radars and meteorological radar with IMT systems within the 2 700-2 900 MHz band,

noting

a) that Report ITU-R M.2078, on spectrum estimates for IMT, approved in 2006, predicted total spectrum requirements for 2020 to be 1 280 MHz and 1 720 MHz for low and high user demand scenarios, respectively;

b) that Report ITU-R M.2243, approved in 2011, contains an assessment of the global mobile broadband deployments and forecasts for IMT;

c) that IMT encompasses both IMT-2000 and IMT-Advanced collectively, as described in Resolution ITU-R 56;

d) that Resolution ITU-R 57 addresses the principles for the process of development of IMT-Advanced, and Question ITU-R 77-7/5 considers the needs of developing countries in the development and implementation of IMT;

e) that Question ITU-R 229-3/5 seeks to address the further development of IMT;

f) that Recommendations ITU-R M.1457 and ITU-R M.2012 contain detailed specifications of the terrestrial radio interfaces of IMT-2000 and IMT-Advanced, respectively,

recognizing

a) that there is a fairly long lead time between the identification of frequency bands by world radiocommunication conferences and the deployment of systems in those bands, and timely availability of spectrum is therefore important to support the development of IMT and other terrestrial mobile broadband applications;

- b) that IMT systems have been in operation since the year 2000;
- c) that the need for cost-effective implementation of IMT, particularly in many developing countries and countries with large areas of low population density, and the particular advantages of lower frequency bands for these purposes;
- d) that the advantages of the frequency bands below 1 GHz for wide coverage and those above 1 GHz for higher data rates with respect to use of IMT systems are noted in Resolutions **224 (Rev.WRC-12)** and **223 (Rev.WRC-12)**, respectively;
- e) the use of relevant parts of the spectrum by other radiocommunication services, many of which involve significant investment in infrastructure or represent significant societal benefit, and the evolving needs of these services,

resolves to invite ITU-R

- 1 to study additional spectrum requirements, taking into account:
- technical and operational characteristics of IMT systems, including the evolution of IMT through advances in technology and spectrally-efficient techniques, and their deployment;
 - the bands currently identified for IMT, the technical conditions of their use, and the possibility of optimizing the use of these bands with a view to increasing spectrum efficiency;
 - the evolving needs, including user demand for IMT and other terrestrial mobile broadband applications;
 - the needs of developing countries;
 - the time-frame in which spectrum would be needed;
- 2 to study potential candidate frequency bands, taking into account the results of the studies under *resolves to invite ITU-R 1*, protection of existing services and the need for harmonization,

further resolves

1 that the studies referred to in *resolves to invite ITU-R 2* include sharing and compatibility studies with services already having allocations in the potential candidate bands and in adjacent bands, as appropriate, taking into account the current and planned use of these bands by the existing services, as well as the applicable studies already performed in ITU-R;

2 to invite WRC-15 to consider the results of the above studies and take appropriate actions,

encourages administrations

to submit contributions during the study period on their assessment of the impact on the existing services, based on the studies carried out under this Resolution,

invites administrations

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

RESOLUTION 234 (WRC-12)

Additional primary allocations to the mobile-satellite service within the bands from 22 GHz to 26 GHz

The World Radiocommunication Conference (Geneva, 2012),

considering

- a)* that ITU-R has studied the spectrum requirements for the satellite component of International Mobile Telecommunications (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 MHz and 90 MHz by 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 MHz and 257 MHz by the year 2020;
- d)* that MSS systems which are not part of the satellite component of IMT may also require additional spectrum,

further considering

- a)* that ITU-R has also studied the spectrum requirements for MSS broadband applications by the year 2020, and the results are contained in Report ITU-R M.2218;
- b)* that the results in Report ITU-R M.2218 indicate a shortfall of spectrum for MSS broadband applications of between 240 MHz and 335 MHz by the year 2020 in both the space-to-Earth and Earth-to-space directions,

recognizing

- a) that MSS systems implementing the satellite component of IMT and broadband applications require additional spectrum;
- b) that no allocations were made for the mobile-satellite service in the range 4-16 GHz at WRC-12, and therefore the shortfall of spectrum for satellite IMT and broadband applications still needs to be addressed,

further recognizing

- a) that the bands from 22 GHz to 26 GHz include allocations to other services;
- b) that unwanted emissions in the band 23.6-24 GHz (see No. **5.340**) will need to be limited to ensure protection of systems of the EESS (passive), SRS (passive) and radio astronomy services,

resolves to invite ITU-R

to complete, for WRC-15, sharing and compatibility studies towards additional allocations to the mobile-satellite service in the Earth-to-space and space-to-Earth directions, within portions of the bands between 22 GHz and 26 GHz, while ensuring protection of existing services within these bands as well as taking into account No. **5.340** and No. **5.149**,

invites administrations

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

RESOLUTION 358 (WRC-12)

Consideration of improvement and expansion of on-board communication stations in the maritime mobile service in the UHF bands

The World Radiocommunication Conference (Geneva, 2012),

considering

- a)* that only six frequencies, in the bands between 450 and 470 MHz, are currently identified in No. **5.287** for on-board communication stations;
- b)* that the technical characteristics of equipment used for on-board communications are identified in Recommendation ITU-R M.1174,

recognizing

- a)* that on-board communication stations are intended for use for internal communications on board a ship, or between a ship and its lifeboats and life-rafts during lifeboat drills or operations, or for communication within a group of vessels being towed or pushed, as well as for line handling and mooring instructions;
- b)* that on board many ships the existing channels are congested to the extent that ship and port operations are impacted by cross transmissions;
- c)* that it is important that the services to which the frequency band is currently allocated need to be protected,

noting

that No. **5.286AA** identifies the frequency band 450-470 MHz for use by administrations wishing to implement International Mobile Telecommunications (IMT),

resolves to invite WRC-15

to consider, based on the results of ITU-R studies, the need to possibly identify additional UHF channels within the bands already allocated to the maritime mobile service for on-board communication stations,

invites ITU-R

to conduct, in time for WRC-15, studies to determine the spectrum requirements and potential frequency bands for on-board communication stations, taking into account the protection of services to which the frequency band is currently allocated,

invites ITU-R members

to contribute to these studies,

instructs the Secretary-General

to bring this Resolution to the attention of IMO, IEC and CIRM.

RESOLUTION 359 (WRC-12)

Consideration of regulatory provisions for modernization of the Global Maritime Distress and Safety System and studies related to e-navigation

The World Radiocommunication Conference (Geneva, 2012),

considering

- a)* that there is a continuing need in the Global Maritime Distress and Safety System (GMDSS), on a global basis, for improved communications to enhance maritime capabilities;
- b)* that the International Maritime Organization (IMO) has initiated work plans for GMDSS modernization;
- c)* that the Automatic Identification System (AIS) offers potential enhancements to VHF maritime safety communications;
- d)* that advanced maritime MF/HF/VHF data systems and satellite communication systems may be used to deliver Maritime Safety Information (MSI) and other GMDSS communications;
- e)* that additional global and regional GMDSS satellite providers may be considered by IMO;
- f)* that IMO is developing a strategy and implementation plan for e-navigation, defined as the harmonized collection, integration, exchange, presentation and analysis of marine information on board and ashore by electronic means to enhance berth-to-berth navigation and related services for safety and security at sea and protection of the marine environment;
- g)* that GMDSS modernization may be influenced by the development of e-navigation,

noting

that WRC-12:

- a) has reviewed Appendix 17 and Appendix 18 to improve efficiency and introduce bands for new digital technology;
- b) has reviewed the regulatory provisions and spectrum allocations for use by maritime safety systems for ships and ports,

recognizing

- a) that advanced maritime communication systems may support the implementation of GMDSS modernization and e-navigation;
- b) that IMO efforts to implement GMDSS modernization and e-navigation may require a review of the Radio Regulations to accommodate advanced maritime communication systems;
- c) that due to the importance of these radio links in ensuring the safe operation of shipping and commerce and security at sea, they must be resilient to interference,

resolves to invite WRC-18

- 1 to consider possible regulatory actions, including spectrum allocations based on the ITU-R studies, to support GMDSS modernization;
- 2 to consider possible regulatory actions, including spectrum allocations based on the ITU-R studies, for maritime mobile service supporting e-navigation,

invites ITU-R

to conduct studies, as a matter of urgency, taking into consideration the activities of IMO, in order to determine spectrum requirements to support GMDSS modernization, the implementation of e-navigation and propose possible regulatory actions,

invites

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

instructs the Secretary-General

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

RESOLUTION 360 (WRC-12)

Consideration of regulatory provisions and spectrum allocations for enhanced Automatic Identification System technology applications and for enhanced maritime radiocommunication

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that Automatic Identification System (AIS) is a proven maritime data system, with a large number of ships equipped and a supporting terrestrial and satellite infrastructure established;
- b) that AIS is used in the ship movement service for collision avoidance;
- c) that AIS enables the identification of stations using this system;
- d) that AIS provides information about a ship and its cargo;
- e) that AIS provides a means for ships to exchange ship data, including identification, position, course and speed, with other nearby ships and coast stations;
- f) that AIS has the capability for data exchange by application-specific messages for navigation and safety-related purposes;
- g) that, due to capacity concerns, the use of AIS application-specific messages is currently limited;
- h) that AIS use is increasing rapidly, with potential overloading of the current AIS1 and AIS2 (Appendix 18 of the Radio Regulations) frequencies;
- i) that the establishment of the maritime AIS offers potential enhancements to VHF maritime safety communications;
- j) that there is an increasing need, on a global basis, for maritime radiocommunications for enhanced maritime safety,

recognizing

- a) that the implementation of AIS globally offers the ability to improve search and rescue operations;
- b) that the AIS Search and Rescue Transmitter (SART) is identified by the International Maritime Organization (IMO) as an alternative device to the Radar SART;
- c) that AIS is used for channel management of AIS channels and future VHF digital data channels, and for ship-to-shore data exchange;
- d) that additional AIS channels may be required for radiocommunications involving, but not limited to, area warnings and meteorological and hydrographic data, as well as channel management of AIS, future VHF digital data and ship-to-shore data exchange;
- e) that additional channels for AIS may be required for search and rescue;
- f) that due to the importance of AIS in ensuring the safe operation of international shipping and commerce, it should be properly protected from harmful interference;
- g) that studies should be carried out to identify additional spectrum needed for emerging AIS terrestrial and satellite operational requirements;
- h) that, in ensuring the safe operation of international shipping and commerce, additional spectrum for AIS applications should be given priority in the maritime mobile and mobile-satellite services;
- i) that IMO is developing a Polar Code;
- j) that No. **5.353A** and No. **5.357A** and Resolution **222 (Rev.WRC-12)** are outside the scope of this Resolution,

resolves to invite WRC-15

1 to consider, based on the results of ITU-R studies, modifications to the Radio Regulations, including possible spectrum allocations, to enable new AIS terrestrial and satellite applications, while ensuring that these applications will not degrade the current AIS operations and other existing services;

2 to consider, based on the results of ITU-R studies, additional or new applications for maritime radiocommunication within existing maritime mobile and mobile-satellite service allocations, and if necessary to take appropriate regulatory measures,

invites ITU-R

1 to conduct, as a matter of urgency, studies that identify potential regulatory actions to accommodate emerging maritime mobile service and mobile-satellite service AIS requirements;

2 to conduct, as a matter of urgency, studies on additional or new applications for maritime radiocommunication within maritime mobile and mobile-satellite service allocations, and to identify potential regulatory actions to accommodate emerging maritime radiocommunication requirements;

3 to complete studies in time for WRC-15 taking into account existing systems and services that share the bands,

further invites

all members of the Radiocommunication Sector and IMO, the World Meteorological Organization (WMO), the International Hydrographic Organization (IHO), the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA), the International Electrotechnical Commission (IEC) and the International Radio Maritime Committee (CIRM) to contribute to these studies,

instructs the Secretary-General

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

RESOLUTION 423 (WRC-12)

Consideration of regulatory actions, including allocations, to support Wireless Avionics Intra-Communications

The World Radiocommunication Conference (Geneva, 2012),

considering

- a)* that the future generation of aircraft is being designed to enhance efficiency, reliability and safety, as well as to be more environmentally friendly;
- b)* that Wireless Avionics Intra-Communications (WAIC) systems are restricted to radiocommunications between two or more points integrated into or installed on a single aircraft;
- c)* that WAIC systems do not include communications between an aircraft and the ground, another aircraft or a satellite;
- d)* that WAIC systems have to ensure the safe operation of an aircraft and have to operate with an appropriate level of protection to comply with the safety and regularity of flight;
- e)* that WAIC systems will be operated on the ground and during all phases of flight;
- f)* that aircraft equipped with WAIC systems will be operated globally and will cross national borders,

recognizing

- a)* that WAIC systems are being developed to operate safely and efficiently in one or more non-contiguous radio-frequency bands, emphasizing those currently allocated to the aeronautical mobile service and aeronautical radionavigation service;

b) that WAIC systems operating inside an aircraft will benefit from fuselage attenuation and other aircraft surface attenuation in order to facilitate sharing with other services;

c) that Report ITU-R M.2197 provides technical characteristics and operational objectives for WAIC systems,

resolves

that WRC-15 consider, based on the results of ITU-R studies, possible regulatory actions, including appropriate aeronautical allocations, to support the implementation of WAIC systems, while taking into account spectrum requirements for WAIC and protection requirements for systems operating in accordance with existing allocations,

invites ITU-R

1 to conduct, in time for WRC-15, the necessary studies to determine the spectrum requirements needed to support WAIC systems;

2 to conduct sharing and compatibility studies, based on the results of *invites ITU-R 1*, to determine appropriate frequency bands and regulatory actions;

3 when conducting studies in accordance with *invites ITU-R 2*, to consider:

- i) frequency bands within existing worldwide aeronautical mobile service, aeronautical mobile (R) service and aeronautical radionavigation service allocations;
- ii) additional frequency bands above 15.7 GHz for aeronautical services if spectrum requirements cannot be met in frequency bands studied under *invites ITU-R 3 i*),

invites

the International Civil Aviation Organization (ICAO) to contribute to these studies,

instructs the Secretary-General

to bring this Resolution to the attention of ICAO.

RESOLUTION 646 (Rev.WRC-12)

Public protection and disaster relief

The World Radiocommunication Conference (Geneva, 2012),

considering

- a)* that the term “public protection radiocommunication” refers to radiocommunications used by responsible agencies and organizations dealing with maintenance of law and order, protection of life and property and emergency situations;
- b)* that the term “disaster relief radiocommunication” refers to radiocommunications used by agencies and organizations dealing with a serious disruption of the functioning of society, posing a significant widespread threat to human life, health, property or the environment, whether caused by accident, natural phenomena or human activity, and whether developing suddenly or as a result of complex, long-term processes;
- c)* the growing telecommunication and radiocommunication needs of public protection agencies and organizations, including those dealing with emergency situations and disaster relief, that are vital to the maintenance of law and order, protection of life and property, disaster relief and emergency response;
- d)* that many administrations wish to promote interoperability and interworking between systems used for public protection and disaster relief, both nationally and for cross-border operations in emergency situations and for disaster relief;
- e)* that current public protection and disaster relief applications are mostly narrow-band supporting voice and low data-rate applications, typically in channel bandwidths of 25 kHz or less;

- f)* that, although there will continue to be narrow-band requirements, many future applications will be wideband (indicative data rates in the order of 384-500 kbit/s) and/or broadband (indicative data rates in the order of 1-100 Mbit/s) with channel bandwidths dependent on the use of spectrally efficient technologies;
- g)* that new technologies for wideband and broadband public protection and disaster relief applications are being developed in various standards organizations¹;
- h)* that continuing development of new technologies such as International Mobile Telecommunications (IMT) and Intelligent Transportation Systems (ITS) may be able to support or supplement advanced public protection and disaster relief applications;
- i)* that some commercial terrestrial and satellite systems are complementing the dedicated systems in support of public protection and disaster relief, that the use of commercial solutions will be in response to technology development and market demands and that this may affect the spectrum required for those applications and for commercial networks;

¹ For example, a joint standardization programme between the European Telecommunications Standards Institute (ETSI) and the Telecommunications Industry Association (TIA), known as Project MESA (Mobility for Emergency and Safety Applications) has commenced for broadband public protection and disaster relief. Also, the Working Group on Emergency Telecommunications (WGET), convened by the United Nations Office for Humanitarian Affairs (OCHA), is an open forum to facilitate the use of telecommunications in the service of humanitarian assistance comprising United Nations entities, major non-governmental organizations, the International Committee of the Red Cross (ICRC), ITU and experts from the private sector and academia. Another platform for coordination and to foster harmonized global Telecommunication for Disaster Relief (TDR) standards is the TDR Partnership Coordination Panel, which was established under the coordination of ITU with participation of international telecommunication service providers, related government departments, standards development organizations, and disaster relief organizations.

j) that Resolution 36 (Rev. Guadalajara, 2010) of the Plenipotentiary Conference urges Member States Parties to the Tampere Convention to take all practical steps for the application of the Tampere Convention and to work closely with the operational coordinator as provided for therein;

k) that Recommendation ITU-R M.1637 offers guidance to facilitate the global circulation of radiocommunication equipment in emergency and disaster relief situations;

l) that some administrations may have different operational needs and spectrum requirements for public protection and disaster relief applications depending on the circumstances;

m) that the Tampere Convention on the Provision of Telecommunications Resources for Disaster Mitigation and Relief Operations (Tampere, 1998), an international treaty deposited with the United Nations Secretary-General and related United Nations General Assembly Resolutions and Reports are also relevant in this regard,

recognizing

a) the benefits of spectrum harmonization such as:

- increased potential for interoperability;
- a broader manufacturing base and increased volume of equipment resulting in economies of scale and expanded equipment availability;
- improved spectrum management and planning; and
- enhanced cross-border coordination and circulation of equipment;

b) that the organizational distinction between public protection activities and disaster relief activities are matters for administrations to determine at the national level;

- c) that national spectrum planning for public protection and disaster relief needs to have regard to cooperation and bilateral consultation with other concerned administrations, which should be facilitated by greater levels of spectrum harmonization;
- d) the benefits of cooperation between countries for the provision of effective and appropriate humanitarian assistance in case of disasters, particularly in view of the special operational requirements of such activities involving multinational response;
- e) the needs of countries, particularly the developing countries², for low-cost communication equipment;
- f) that the trend is to increase the use of technologies based on Internet Protocols;
- g) that currently some bands or parts thereof have been designated for existing public protection and disaster relief operations, as documented in Report ITU-R M.2033³;
- h) that for solving future bandwidth requirements, there are several emerging technology developments such as software-defined radio, advanced compression and networking techniques that may reduce the amount of new spectrum required to support some public protection and disaster relief applications;
- i) that in times of disasters, if most terrestrial-based networks are destroyed or impaired, amateur, satellite and other non-ground-based networks may be available to provide communication services to assist in public protection and disaster relief efforts;
- j) that the amount of spectrum needed for public protection on a daily basis can differ significantly between countries, that certain amounts of

² Taking into account, for example, the ITU-D Handbook on disaster relief.

³ 3-30, 68-88, 138-144, 148-174, 380-400 MHz (including CEPT designation of 380-385/390-395 MHz), 400-430, 440-470, 764-776, 794-806 and 806-869 MHz (including CITEL designation of 821-824/866-869 MHz).

spectrum are already in use in various countries for narrow-band applications, and that in response to a disaster, access to additional spectrum on a temporary basis may be required;

k) that in order to achieve spectrum harmonization, a solution based on regional frequency ranges⁴ may enable administrations to benefit from harmonization while continuing to meet national planning requirements;

l) that not all frequencies within an identified common frequency range will be available within each country;

m) that the identification of a common frequency range within which equipment could operate may ease the interoperability and/or inter-working, with mutual cooperation and consultation, especially in national, regional and cross-border emergency situations and disaster relief activities;

n) that when a disaster occurs, the public protection and disaster relief agencies are usually the first on the scene using their day-to-day communication systems, but that in most cases other agencies and organizations may also be involved in disaster relief operations,

noting

a) that many administrations use frequency bands below 1 GHz for narrow-band public protection and disaster relief applications;

b) that applications requiring large coverage areas and providing good signal availability would generally be accommodated in lower frequency bands and that applications requiring wider bandwidths would generally be accommodated in progressively higher bands;

⁴ In the context of this Resolution, the term “frequency range” means a range of frequencies over which a radio equipment is envisaged to be capable of operating but limited to specific frequency band(s) according to national conditions and requirements.

c) that public protection and disaster relief agencies and organizations have an initial set of requirements, including but not limited to interoperability, secure and reliable communications, sufficient capacity to respond to emergencies, priority access in the use of non-dedicated systems, fast response times, ability to handle multiple group calls and the ability to cover large areas as described in Report ITU-R M.2033;

d) that, while harmonization may be one method of realizing the desired benefits, in some countries, the use of multiple frequency bands can contribute to meeting the communication needs in disaster situations;

e) that many administrations have made significant investments in public protection and disaster relief systems;

f) that flexibility must be afforded to disaster relief agencies and organizations to use current and future radiocommunications, so as to facilitate their humanitarian operations,

emphasizing

a) that the frequency bands identified in this Resolution are allocated to a variety of services in accordance with the relevant provisions of the Radio Regulations and are currently used intensively by the fixed, mobile, mobile satellite and broadcasting services;

b) that flexibility must be afforded to administrations:

- to determine, at national level, how much spectrum to make available for public protection and disaster relief from the bands identified in this Resolution in order to meet their particular national requirements;
- to have the ability for bands identified in this Resolution to be used by all services having allocations within those bands according to the provisions of the Radio Regulations, taking into account the existing applications and their evolution;

- to determine the need and timing of availability as well as the conditions of usage of the bands identified in this Resolution for public protection and disaster relief in order to meet specific national situations,

resolves

1 to strongly recommend administrations to use regionally harmonized bands for public protection and disaster relief to the maximum extent possible, taking into account the national and regional requirements and also having regard to any needed consultation and cooperation with other concerned countries;

2 to encourage administrations, for the purposes of achieving regionally harmonized frequency bands/ranges for advanced public protection and disaster relief solutions, to consider the following identified frequency bands/ranges or parts thereof when undertaking their national planning:

- in Region 1: 380-470 MHz as the frequency range within which the band 380-385/ 390-395 MHz is a preferred core harmonized band for permanent public protection activities within certain countries of Region 1 which have given their agreement;
- in Region 2⁵: 746-806 MHz, 806-869 MHz, 4 940-4 990 MHz;
- in Region 3⁶: 406.1-430 MHz, 440-470 MHz, 806-824/851-869 MHz, 4 940-4 990 MHz and 5 850-5 925 MHz;

3 that the identification of the above frequency bands/ranges for public protection and disaster relief does not preclude the use of these bands/frequencies by any application within the services to which these

⁵ Venezuela has identified the band 380-400 MHz for public protection and disaster relief applications.

⁶ Some countries in Region 3 have also identified the bands 380-400 MHz and 746-806 MHz for public protection and disaster relief applications.

bands/frequencies are allocated and does not preclude the use of nor establish priority over any other frequencies for public protection and disaster relief in accordance with the Radio Regulations;

4 to encourage administrations, in emergency and disaster relief situations, to satisfy temporary needs for frequencies in addition to what may be normally provided for in agreements with the concerned administrations;

5 that administrations encourage public protection and disaster relief agencies and organizations to utilize both existing and new technologies and solutions (satellite and terrestrial), to the extent practicable, to satisfy interoperability requirements and to further the goals of public protection and disaster relief;

6 that administrations may encourage agencies and organizations to use advanced wireless solutions taking into account *considering h) and i)* for providing complementary support to public protection and disaster relief;

7 to encourage administrations to facilitate cross-border circulation of radiocommunication equipment intended for use in emergency and disaster relief situations through mutual cooperation and consultation without hindering national legislation;

8 that administrations encourage public protection and disaster relief agencies and organizations to utilize relevant ITU-R Recommendations in planning spectrum use and implementing technology and systems supporting public protection and disaster relief;

9 to encourage administrations to continue to work closely with their public protection and disaster relief community to further refine the operational requirements for public protection and disaster relief activities;

10 that manufacturers should be encouraged to take this Resolution into account in future equipment designs, including the need for administrations to operate within different parts of the identified bands,

invites ITU-R

1 to continue its technical studies and to make recommendations concerning technical and operational implementation, as necessary, for advanced solutions to meet the needs of public protection and disaster relief radiocommunication applications, taking into account the capabilities, evolution and any resulting transition requirements of the existing systems, particularly those of many developing countries, for national and international operations;

2 to conduct further appropriate technical studies in support of possible additional identification of other frequency ranges to meet the particular needs of certain countries in Region 1 which have given their agreement, especially in order to meet the radiocommunication needs of public protection and disaster relief agencies.

RESOLUTION 647 (Rev.WRC-12)

Spectrum management guidelines for emergency and disaster relief radiocommunication¹

The World Radiocommunication Conference (Geneva, 2012),

considering

a) that natural disasters have underscored the importance of utilizing effective measures to mitigate their effects, including prediction, detection and alerting through the coordinated and effective use of radio-frequency spectrum;

b) ITU's comprehensive role in emergency communications, not only in the field of radiocommunications, but also in the area of technical standards to facilitate interconnection and interoperability of networks for monitoring and management at the onset of and during emergency and disaster situations, and as an integral part of the telecommunication development agenda through the Hyderabad Action Plan;

c) that Resolution **644 (Rev.WRC-12)**, on radiocommunication resources for early warning, disaster mitigation and relief operations, resolves that ITU-R continue to study, as a matter of urgency, those aspects of radiocommunications/ICT that are relevant to early warning, disaster mitigation and relief operations;

d) that [Resolution 646 \(Rev.WRC-12\)](#) addresses the broader category of public protection and disaster relief (PPDR) and encourages

¹ The term "emergency and disaster relief radiocommunication" refers to radiocommunications used by agencies and organizations dealing with a serious disruption of the functioning of society, posing a significant widespread threat to human life, health, property or the environment, whether caused by accident, natural phenomena or human activity, and whether occurring suddenly or as a result of complex, long-term processes.

administrations to consider identified frequency bands/ranges or parts thereof when undertaking their national planning for the purposes of achieving regionally harmonized frequency bands/ranges for advanced public protection and disaster relief solutions;

e) that Resolution 36 (Rev. Guadalajara, 2010) addresses the role of telecommunications/ICTs in the service of humanitarian assistance, Resolution 136 (Rev. Guadalajara, 2010) addresses the use of ICTs for monitoring and management in emergency and disaster situations for early warning, prevention, mitigation and relief, and Resolution 34 (Rev. Hyderabad, 2010) addresses the role of telecommunications/ICTs in disaster preparedness, early warning, rescue, mitigation, relief and response,

recognizing

a) that the Tampere Convention on the Provision of Telecommunications Resources for Disaster Mitigation and Relief Operations (Tampere, 1998)², an international treaty deposited with the United Nations Secretary-General, calls on the States Parties, when possible, and in conformity with their national law, to develop and implement measures to facilitate the availability of telecommunication resources for such operations;

b) that some administrations may have different operational needs and spectrum requirements for emergency and disaster-relief applications, depending on their circumstances;

c) that the immediate availability of spectrum to support emergency radiocommunication equipment is important for successful telecommunications in the very early stages of humanitarian assistance intervention for disaster relief,

² However, a number of countries have not ratified the Tampere Convention.

aware

of the progress made in regional organizations around the world, and in particular in regional telecommunication organizations, on matters related to emergency communications planning and response,

recognizing further

a) Resolution ITU-R 55, which invites the ITU-R Study Groups to take into consideration the scope of ongoing studies/activities outlined in the annex to the Resolution, and to develop guidelines related to the management of radiocommunications in disaster prediction, detection, mitigation and relief, collaboratively and cooperatively, within ITU and with organizations external to the Union, in order to avoid duplication of effort;

b) Resolution ITU-R 53, which instructs the Director of the Radio-communication Bureau to assist Member States with their emergency radio-communication preparedness activities such as the listing of currently available frequencies for use in emergency situations for inclusion in a database maintained by the Bureau,

noting

a) that when a disaster occurs, the disaster relief agencies are usually the first on the scene using their day-to-day communication systems, but that in most cases other agencies and organizations may also be involved in disaster relief operations;

b) that there is a critical requirement to perform immediate spectrum management actions, including frequency coordination, sharing and spectrum reuse, within a disaster area;

c) that national spectrum planning for emergency and disaster relief should take into account the need for cooperation and bilateral consultation with other concerned administrations, which can be facilitated by spectrum harmonization, as well as agreed spectrum management guidelines pertaining to disaster relief and emergency planning;

d) that in times of disasters, radiocommunication facilities may be destroyed or impaired and the national regulatory authorities may not be able to provide the necessary spectrum management services for the deployment of radio systems for relief operations;

e) that the identification of frequency availability within individual administrations within which equipment could operate may ease the interoperability and/or interworking, with mutual cooperation and consultation, especially in national, regional and cross-border emergency situations and disaster relief activities,

noting further

a) that flexibility must be afforded to disaster relief agencies and organizations to use current and future radiocommunications, so as to facilitate their humanitarian operations;

b) that it is in the interest of administrations and disaster relief agencies and organizations to have access to updated information on national spectrum planning for emergency and disaster relief,

taking into account

a) BR Circular Letters CR/281 (13 March 2008), CR/283 (6 May 2008) and its Corrigendum 1 (13 May 2008), CR/288 (17 July 2008) and CR/291 (9 October 2008), concerning the preparatory steps towards the establishment of a database of available frequencies/frequency bands for use by terrestrial and space services in emergency situations, as well as the data formats for their submission;

b) that, pursuant to BR Circular Letter CR/323 (31 March 2011), the Bureau advised all administrations that only limited information had been received for both terrestrial and space services,

resolves

- 1 to encourage administrations to communicate to BR, as soon as possible, the frequencies available for use in emergency and disaster relief;
- 2 to reiterate to administrations the importance of having frequencies available for use in the very early stages of humanitarian assistance intervention for disaster relief,

instructs the Director of the Radiocommunication Bureau

- 1 to continue to assist Member States with their emergency communication preparedness activities by maintaining the database³ of currently available frequencies for use in emergency situations, which are not limited to those listed in [Resolution 646 \(Rev.WRC-12\)](#), and by issuing an appropriate listing, taking into account Resolution ITU-R 53;
- 2 to maintain the database and facilitate online access thereto by administrations, national regulatory authorities, disaster relief agencies and organizations, in particular the United Nations Emergency Relief Coordinator, in accordance with the operating procedures developed for disaster situations;
- 3 to collaborate with the United Nations Office for the Coordination of Humanitarian Affairs and other organizations, as appropriate, in the development and dissemination of standard operating procedures and relevant spectrum management practices for use in the event of a disaster situation;
- 4 to take into consideration all relevant activities in ITU's other two Sectors and General Secretariat;
- 5 to report on the progress on this Resolution to subsequent World Radiocommunication Conferences,

³ The database may be accessed at <http://www.itu.int/ITU-R/go/res647>.

invites ITU-R

to conduct studies as necessary, and as a matter of urgency, in support of the establishment of appropriate spectrum management guidelines applicable in emergency and disaster relief operations,

invites the Director of the Telecommunication Standardization Bureau and the Director of the Telecommunication Development Bureau

to collaborate closely with the Director of the Radiocommunication Bureau to ensure that a consistent and coherent approach is adopted in the development of strategies in response to emergency and disaster situations,

urges administrations

1 to participate in the emergency communication preparedness activities described above and to provide the relevant information to the Bureau concerning their national frequency allocations and spectrum management practices for emergency and disaster relief radiocommunications, taking into account Resolution ITU-R 53;

2 to assist in keeping the database up to date by advising the Bureau on an ongoing basis of any modifications to the information requested above.

RESOLUTION 648 (WRC-12)

Studies to support broadband public protection and disaster relief

The World Radiocommunication Conference (Geneva, 2012),

considering

- a)* that [Resolution 646 \(Rev.WRC-12\)](#) encouraged administrations, for the purpose of achieving regionally harmonized frequency bands, to consider certain identified frequency bands on a regional basis for public protection and disaster relief (PPDR) solutions;
- b)* that the scenarios for operational requirements for PPDR activities have undergone changes since 2003;
- c)* that the demand for global development and enhancement of PPDR applications for public protection requirements has shown significant increase since 2003, in order to enable more efficient and more effective responses to both natural and man-made disasters, in addition to responding to routine daily events;
- d)* that there has been remarkable growth in the data-traffic demand for broadband mobile public protection applications, including real-time mobile video applications, and for safety applications, and this tendency will continue to increase on a worldwide basis;
- e)* that these demands are leading to the development of broadband PPDR technologies and applications;
- f)* that the benefits of regionally or internationally harmonized frequency bands for PPDR include:
 - i)* economies of scale and lower costs for implementing specialized systems for PPDR;

- ii) interoperability of systems on a regional and worldwide basis;
- iii) facilitation of local, regional and world planning and coordination activities in spectrum use;
- g) that significant economic and service interoperability benefits are known to accrue from the adoption of harmonized frequency bands;
- h) that there is increased potential for cooperation among public protection entities from various countries during incidents of criminal activity spanning multiple countries;
- i) that the ongoing development of various broadband technologies including IMTs can be suitable to support or complement advanced applications required for PPDR,

noting

- a) Report ITU-R M.2033, on radiocommunication objectives and requirements for public protection and disaster relief;
- b) Recommendation ITU-R M.1826, on harmonized frequency channel plan for broadband public protection and disaster relief operations at 4 940-4 990 MHz in Regions 2 and 3;
- c) draft new Recommendation ITU-R M.2015, on frequency arrangements for public protection and disaster relief (PPDR) radiocommunication systems in UHF bands in accordance with [Resolution 646 \(Rev.WRC-12\)](#);
- d) draft new Recommendation ITU-R M.2009, on radio interface standards for use by public protection and disaster relief operations in some parts of UHF bands in accordance with [Resolution 646 \(Rev.WRC-12\)](#);
- e) the changes that have occurred in the requirements for PPDR applications and the emerging demand for broadband PPDR applications, including high-speed data, video and multimedia,

recognizing

- a) that many new PPDR applications and scenarios, in particular the need for mobile video by PPDR organizations, were not envisaged during WRC-03;
- b) that it is timely to review [Resolution 646 \(Rev.WRC-12\)](#) in order to consider the future direction of spectrum needs of public safety and disaster management agencies,

resolves to invite WRC-15

to consider the studies in *invites ITU-R* below on broadband PPDR and take appropriate action with regard to revision of [Resolution 646 \(Rev.WRC-12\)](#),

invites ITU-R

to study technical and operational issues relating to broadband PPDR and its further development, and to develop recommendations, as required, on:

- technical requirements for PPDR services and applications;
- the evolution of broadband PPDR through advances in technology;
- the needs of developing countries,

invites administrations

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

RESOLUTION 649 (WRC-12)

Possible allocation to the amateur service on a secondary basis at around 5 300 kHz

The World Radiocommunication Conference (Geneva, 2012),

considering

- a)* that amateur stations are regularly used for emergency radiocommunications in the event of hurricanes, typhoons, floods, fires, volcanic eruptions, earthquakes and other disaster situations;
- b)* that Recommendation ITU-R M.1042-3, on disaster communications in the amateur and amateur-satellite services, encourages the development of such services capable of providing radiocommunications in the event of natural disasters, and recommends that their networks be robust, flexible and independent of other telecommunication services and capable of operating from emergency power;
- c)* that communications in the HF bands allocated to the amateur service play a major role in work to mitigate catastrophes and in the delivery of communications in support of relief operations in areas where the telecommunication infrastructure is weak or has collapsed;
- d)* that the various frequency bands allocated to the amateur service are contained in the Table of Frequency Allocations in Article 5 of the Radio Regulations,

recognizing

- a)* that radiocommunication in the HF bands is dependent on propagation factors, with the result that frequencies in different bands have to be used to maintain stable communication for a relatively sustained period of time, with frequency changes in the case of communications with different correspondents located at very different distances;

b) that it is essential that, in all cases, the maximum usable frequency (MUF) should not be excessively far from the next band allocated to the amateur service, so as to permit the setting up of communications in this band using typical amateur service antennas and power levels;

c) that, in the current allocations to the amateur service in the HF bands, there is a significant jump, which causes many problems in terms of communication when the MUF falls below 7 MHz and the lowest usable frequency (LUF) is above 4 MHz, with the result that amateur stations would need to be able to access spectrum at around 5 MHz in order to fulfil their communication functions, particularly when they are engaged in providing emergency communications in response to disaster situations,

noting

a) that the band 5 250-5 450 kHz is allocated to the fixed and mobile services, except aeronautical mobile, on a primary basis;

b) that an allocation of an appropriate amount of spectrum, not necessarily contiguous, to the amateur service at around 5 300 kHz would be adequate to better satisfy its needs associated with use for providing communications in disaster situations and during relief operations;

c) that the band 10 100-10 150 kHz is already allocated to the fixed service on a primary basis and to the amateur service on a secondary basis, and that effective use of both services has been possible,

resolves to invite WRC-15

to consider, based on the results of the ITU-R studies referred to in *invites ITU-R* below, the possibility of making an allocation of an appropriate amount of spectrum, not necessarily contiguous, to the amateur service on a secondary basis within the band 5 250-5 450 kHz,

invites ITU-R

- 1 to study spectrum requirements for a secondary allocation to the amateur service within the band 5 250-5 450 kHz;
- 2 to carry out sharing studies on the impact to other services currently allocated in the band referred to in *invites ITU-R 1* and in the adjacent bands;
- 3 to complete studies in time for WRC-15.

RESOLUTION 650 (WRC-12)

Allocation for the Earth exploration-satellite service (Earth-to-space) in the 7-8 GHz range

The World Radiocommunication Conference (Geneva, 2012),

considering

a) that there is limited bandwidth available in the 2 025-2 110 MHz and 2 200-2 290 MHz bands for Earth exploration-satellite (EESS) satellite tracking, telemetry and control (TT&C) due to the fact that hundreds of satellites use these bands;

b) that an EESS (Earth-to-space) allocation in the 7-8 GHz range would allow its use for TT&C in combination with the existing EESS (space-to-Earth) allocation in the band 8 025-8 400 MHz, thereby alleviating the problem mentioned in *considering a)*;

c) that a preliminary sharing analysis indicates that the frequency range 7 145-7 235 MHz may present a favourable sharing scenario with the existing services;

d) that an EESS (Earth-to-space) allocation in the 7-8 GHz range would allow for uplinks and downlinks on the same transponder, increasing efficiency and reducing satellite complexity,

recognizing

that congestion in the 2 025-2 110 MHz and 2 220-2 290 MHz bands increases the probability of harmful interference, which could contribute to deleterious effects on critical environmental data available only through EESS satellite resources,

further recognizing

a) that the number of EESS ground station receivers in the band 8 025-8 400 MHz is small and that they are usually located at high latitudes;

b) that EESS telecommand uplinks and corresponding EESS ground station receivers typically share the same ground station locations;

c) that space research service (Earth-to-space) (deep space) transmitters operate in the 7 145-7 190 MHz band at several locations throughout the world,

resolves to invite ITU-R

1 to study spectrum requirements in the 7-8 GHz range for EESS (Earth-to-space) telecommand operations in order to complement telemetry operations of EESS (space-to-Earth) in the 8 025-8 400 MHz band;

2 to conduct compatibility studies between EESS (Earth-to-space) systems and existing services, with priority to the band 7 145-7 235 MHz, and then within other portions of the 7-8 GHz range only if the band 7 145-7 235 MHz is found not to be suitable;

3 to complete the 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 basis for the work of WRC-15,

resolves to invite WRC-15

to review the results of these studies with a view to providing a worldwide primary allocation to EESS (Earth-to-space) in the range 7-8 GHz with priority to the band 7 145-7 235 MHz,

invites administrations

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

instructs the Secretary-General

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

RESOLUTION 651 (WRC-12)

Possible extension of the current worldwide allocation to the Earth exploration-satellite (active) service in the frequency band 9 300-9 900 MHz by up to 600 MHz within the frequency bands 8 700-9 300 MHz and/or 9 900-10 500 MHz

The World Radiocommunication Conference (Geneva, 2012),

considering

a) that there is a growing demand for increasing radar image resolution to satisfy global environmental monitoring which can only be achieved with greater transmission bandwidth;

b) that there is a need to provide additional frequency spectrum around the existing allocation to the Earth exploration-satellite service (EESS) (active) in the frequency band 9 300-9 900 MHz, in order to increase the available bandwidth by 600 MHz to satisfy the demand in *considering a)*;

c) that radars in EESS (active) operate worldwide in the frequency band 9 300-9 800 MHz on a primary basis under the constraints of No. **5.476A**, and in the frequency band 9 800-9 900 MHz on a secondary basis with respect to the radionavigation and the fixed services, which are both allocated in the frequency band 9 300-9 900 MHz;

d) that Recommendation ITU-R M.1796 contains the technical characteristics and protection criteria for radars in the frequency range 8 500-10 500 MHz;

e) that Report ITU-R RS.2094 contains studies related to the compatibility between EESS (active) and the radiodetermination service in the frequency bands 9 300-9 500 MHz and 9 800-10 000 MHz and between EESS (active) and the fixed service in the frequency band 9 800-10 000 MHz,

recognizing

a) that the EESS (active) is of great value for the global community as identified in Part A of Report ITU-R RS.2178 and Recommendation ITU-R RS.1859;

b) that the envisaged resolution performance of space-borne radars in the EESS (active) in the 9 GHz range requires an additional transmission bandwidth of 600 MHz since the resolution performance of a radar is directly related to its transmission bandwidth;

c) that the aeronautical radionavigation service operating in the frequency band 9 000-9 200 MHz and the maritime radionavigation service operating in the frequency band 9 200-9 500 MHz are used by safety service systems, in accordance with Nos. **1.59** and **4.10**;

d) that it is important to ensure the protection of the existing primary services, including fixed and mobile services, having allocations in the frequency bands 8 700-9 300 MHz and 9 900-10 500 MHz;

e) that it is important to ensure the protection of existing primary space research service operations in the frequency bands 8 400-8 500 MHz and 10.6-10.7 GHz;

f) that it is important to protect the existing primary radio astronomy service and EESS (passive) in the frequency band 10.6-10.7 GHz,

noting

that Resolution 174 (Guadalajara, 2010) of the Plenipotentiary Conference highlights the importance of ICTs, especially for developing countries, for the monitoring and observation of climate change, the management of natural resources and reduction of the risk of natural disasters,

resolves

that, taking into account the results of ITU-R studies, WRC-15 consider the possible extension of the current worldwide allocation to the EESS (active)

in the frequency band 9 300-9 900 MHz by up to 600 MHz on a primary and/or secondary basis, as appropriate, within the frequency range 8 700-9 300 MHz and/or 9 900-10 500 MHz while ensuring protection of existing services and taking due account of the safety services allocated in the frequency band 9 000 to 9 300 MHz,

invites ITU-R

to conduct and complete, in time for WRC-15, compatibility studies addressing:

- EESS (active) and existing services in the frequency bands 8 700-9 300 MHz and 9 900-10 500 MHz in order to ensure the protection of the existing services, taking into account the constraints as per No. **5.476A**;
- unwanted emissions from stations operating in the EESS (active) within the frequency band 8 700-9 300 MHz into stations of the space research service operating in the frequency band 8 400-8 500 MHz;
- unwanted emissions from stations operating in the EESS (active) within the frequency band 9 900-10 500 MHz into stations of the radio astronomy service, space research service (passive) and EESS (passive) operating in the frequency band 10.6-10.7 GHz,

instructs the Secretary-General

to bring this Resolution to the attention of the International Civil Aviation Organization (ICAO), and International Maritime Organization (IMO).

RESOLUTION 652 (WRC-12)

Use of the band 410-420 MHz by the space research service (space-to-space)

The World Radiocommunication Conference (Geneva, 2012),

considering

- a)* that the band 410-420 MHz is allocated to the fixed, mobile (except aeronautical mobile) and space research (space-to-space) services on a primary basis subject to No. **5.268**;
- b)* that No. **5.268** restricts the space research service (SRS) (space-to-space) to operations within 5 km of an orbiting manned space vehicle;
- c)* that No. **5.268** further identifies use of the band 410-420 MHz by SRS (space-to-space) for extra-vehicular activities (EVA),

recognizing

- a)* that use of the band 410-420 MHz for proximity operations by space vehicles approaching orbiting manned space vehicles, such as the International Space Station (ISS), would be advantageous as the propagation and physical properties of this frequency range enable comparable coverage performance in the highly multipath environment of the ISS;
- b)* that space vehicles, whether manned or robotic, operating in the vicinity or approaching the ISS or other orbiting manned space vehicles, need to communicate over distances greater than 5 km to ensure safe operations and docking manoeuvres;
- c)* that power flux-density (pfd) limits contained in No. **5.268** ensure the protection of terrestrial stations operating in the fixed and mobile services independent of the distance from, or the source of, space-to-space communications in the SRS,

recognizing further

- a) that administrations operating orbiting manned space vehicles carefully coordinate frequency usage on and in the vicinity of the manned space vehicle to ensure safe operation;
- b) that EVA operations would not be conducted simultaneously with visiting vehicle approach and docking manoeuvres,

resolves to invite ITU-R

- 1 to conduct sharing studies between SRS (space-to-space) systems communicating in proximity with orbiting manned space vehicles and systems operating in the fixed and mobile (except aeronautical mobile) services in the band 410-420 MHz;
- 2 to complete the 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 basis for the work of WRC-15,

resolves to invite WRC-15

- 1 to review No. **5.268**, taking into account the results of ITU-R studies, including the possible removal or relaxation of the 5 km distance limitation without modifying the current pfd limits;
- 2 to review No. **5.268** to allow more general use of the 410-420 MHz band for SRS (space-to-space) systems beyond extra-vehicular activities,

invites administrations

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

instructs the Secretary-General

to bring this resolution to the attention of the Space Frequency Coordination Group (SFCG) and other international and regional organizations concerned.

RESOLUTION 653 (WRC-12)

Future of the Coordinated Universal Time time-scale

The World Radiocommunication Conference (Geneva, 2012),

considering

- a)* that the procedures for maintaining the Coordinated Universal Time (UTC) time-scale are described by Recommendation ITU-R TF.460-6;
- b)* that UTC is the legal basis for time-keeping for most countries in the world, and *de facto* is the time-scale used in most others;
- c)* that Recommendation ITU-R TF.460-6 states that all standard-frequency and time signal emissions should conform as closely as possible to UTC;
- d)* that Recommendation ITU-R TF.460-6 describes the procedure for the occasional insertion of leap seconds into UTC to ensure that it does not differ by more than 0.9 seconds from the time determined by the rotation of the Earth (UT1);
- e)* that the occasional insertion of leap seconds into UTC may create difficulties for systems and applications that depend on accurate timing,

recognizing

- a)* that some organizations involved with space activities, global navigation satellite systems, metrology, telecommunications, network synchronization and electric power distribution have requested a continuous time-scale;

- b) that for local time-of-day and for other specialized systems, there is a need for a time-scale reckoned with respect to the rotation of the Earth, such as the mean solar time at the prime meridian, formerly known as GMT;
- c) that a change in the reference time-scale may have operational and therefore economic consequences,

noting

- a) that No. **1.14** defines UTC as a time-scale based on the second (SI), as defined in Recommendation ITU-R TF.460-6;
- b) that modification of the definition of UTC may have consequential changes to Nos. **1.14**, **2.5**, **2.6** and some other provisions,

resolves to invite WRC-15

to consider the feasibility of achieving a continuous reference time-scale, whether by the modification of UTC or some other method, and take appropriate action, taking into account ITU-R studies,

invites ITU-R

- 1 to conduct the necessary studies on the feasibility of achieving a continuous reference time-scale for dissemination by radiocommunication systems;
- 2 to study issues related to the possible implementation of a continuous reference time-scale (including technical and operational factors);

invites administrations

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

instructs the Director of the Radiocommunication Bureau

to bring this Resolution to the attention of ITU-T,

instructs the Secretary-General

to bring this Resolution to the attention of relevant organizations such as the International Maritime Organization (IMO), the International Civil Aviation Organization (ICAO), the General Conference of Weights and Measures (CGPM), the Consultative Committee for Time and Frequency (CCTF), the Bureau International des Poids et Mesures (BIPM), the International Earth Rotation and Reference Systems Service (IERS), the International Union of Geodesy and Geophysics (IUGG), the International Union of Radio Science (URSI), the International Organization for Standardization (ISO), the World Meteorological Organization (WMO) and the International Astronomical Union (IAU).

RESOLUTION 654 (WRC-12)

Allocation of the band 77.5-78 GHz to the radiolocation service to support automotive short-range high-resolution radar operations

The World Radiocommunication Conference (Geneva 2012),

considering

- a)* that the use of information and communication technologies (ICT) within intelligent transport systems (ITS), such as automotive short-range high-resolution radars (SRR), may significantly contribute to the improvement of road safety;
- b)* that the availability of spectrum for components of ITS such as SRR would contribute to the goal of improving road safety, including distracted driving, transport efficiency and the quality of the environment;
- c)* that ITU-R has been studying short-range vehicular radars;
- d)* that worldwide compatibility of spectrum allocation would be beneficial in terms of efficient use of spectrum and economies of scale, in order to give the automotive industry as well as the components industry the confidence to make substantial investment in SRR technology;
- e)* that the frequency bands 76-77.5 GHz and 78-81 GHz are already allocated to the radiolocation service on a primary basis in all three ITU Regions;
- f)* that the 77-81 GHz frequency band seems to be the most suitable band for SRR, since 76-77 GHz is designated for long-range automotive radars in many countries and sharing studies have concluded that sharing is not achievable between short-range and long-range automotive radars;
- g)* that the frequency band 77-81 GHz is already designated for SRR in many countries worldwide;

h) that the frequency band 77.5-78 GHz is allocated to the amateur and amateur-satellite services on a primary basis and to the radio astronomy service (RAS) and space research (space-to-Earth) service on a secondary basis;

i) that the aggregate effect of the automotive SRR must be considered;

j) that the 76-77.5 GHz and 79-81 GHz bands are allocated to the RAS on a primary basis, and the 77.5-79 GHz band is allocated to the RAS on a secondary basis;

k) that the 76-77.5 GHz and 78-81 GHz bands are allocated to the amateur, amateur-satellite and space research (space-to-Earth) services on a secondary basis;

l) that sharing with the radio astronomy service has been studied in some countries concluding that SRR operating in the vicinity of radio astronomy stations may cause interference to those stations, but that regulatory measures could be identified enabling coexistence between SRR and the radio astronomy service in the frequency band 77-81 GHz, which is dependent on the aggregated impact of SRR devices transmitting in the direction of a radio astronomy station;

m) that Resolution ITU-R 54-1 calls for studies to achieve harmonization for SRDs,

recognizing

ITU Council Resolution 1318 (Council 2010), on ITU's role in ICTs and improving road safety,

noting

a) that Recommendation ITU-R M.1890, on intelligent transport systems (ITS) – guidelines and objectives, provides general guidelines for ITS radiocommunication systems which covers also SRR;

b) that Recommendation ITU-R M.1452 provides guidance on the use of millimetre wave vehicular radar equipment and on technical

characteristics of millimetre wave radiocommunication systems for data communications to be used for ITS;

c) that, while vehicular SRR is expected to contribute significantly to road safety, such applications have not been defined as a safety service according to No. 1.59 or subject to No. 4.10,

resolves to invite WRC-15

to consider a primary allocation to the radiolocation service in the 77.5-78 GHz frequency band, taking into account the results of ITU-R studies,

invites ITU-R

to conduct, as a matter of urgency, and in time for consideration by WRC-15, the appropriate technical, operational and regulatory studies, including:

- i) sharing studies and regulatory solutions to consider a primary allocation to the radiolocation service in the band 77.5-78 GHz, taking into account incumbent services and existing uses of the band;
- ii) compatibility studies in the band 77.5-78 GHz with services operating in the adjacent bands 76-77.5 GHz and 78-81 GHz;
- iii) spectrum requirements, operational characteristics and evaluation of ITS safety-related applications that would benefit from global or regional harmonization,

invites administrations

to contribute actively to ITU-R studies on this issue,

instructs the Secretary-General

to bring this Resolution to the attention of the international and regional organizations concerned, including ISO and the ITU's Collaboration on ITS Communication Standards.

RESOLUTION 756 (WRC-12)

Studies on possible reduction of the coordination arc and technical criteria used in application of No. 9.41 in respect of coordination under No. 9.7

The World Radiocommunication Conference (Geneva, 2012),

considering

- a)* that the coordination arc methodology was introduced as a means to streamline the examination of coordination filings and thus reduce the efforts of the Bureau;
- b)* that a more efficient coordination process is desirable;
- c)* that further reduction in the coordination arc together with appropriate criteria for identification of affected administrations is desirable;
- d)* that, currently, the of $\Delta T/T$ criterion is used for the identification of affected administrations,

recognizing

- a)* that this Conference has reduced the coordination arc to be used to identify coordination requirements in the 6/4 GHz and 14/10/11/12 GHz frequency bands *;
- b)* that further reductions in the coordination arc in these bands may be warranted;
- c)* that it may also be appropriate to reduce the coordination arc in the 30/20 GHz frequency bands ** used by the FSS;

* 3 400-4 200 MHz (space-to-Earth), 5 725-5 850 MHz (Earth-to-space) in Region 1, 5 850-6 725 MHz (Earth-to-space), 7 025-7 075 MHz (space-to-Earth) and (Earth-to-space), 10.95-11.2 GHz (space-to-Earth), 11.45-11.7 GHz (space-to-Earth), 11.7-12.2 GHz (space-to-Earth) in Region 2, 12.2-12.5 GHz (space-to-Earth) in Region 3, 12.5-12.75 GHz (space-to-Earth) in Regions 1 and 3, 12.7-12.75 GHz (Earth-to-space) in Region 2, and 13.75-14.5 GHz (Earth-to-space).

** 27.5-30 GHz (Earth-to-space), 17.7-20.2 GHz (space-to-Earth).

d) that the improvement of the coordination process in the 6/4 GHz and 14/10/11/12 GHz frequency bands also depends on the technical criteria used in the application of No. **9.41**;

e) that the frequency bands where the current $\Delta T/T$ criterion is used in application of No. **9.41** for coordination sought under No. **9.7** are listed in Table 5-1 to Appendix **5** of the Radio Regulations;

f) that there may be other criteria (e.g. *C/I*, pfd) that could be used for the identification of affected administrations and in the coordination process,

resolves to invite ITU-R

1 to carry out studies to examine the effectiveness and appropriateness of the current criterion ($\Delta T/T > 6\%$) used in the application of No. **9.41** and consider any other possible alternatives (including the alternatives outlined in Annexes 1 and 2 to this Resolution), as appropriate, for the bands referred to in *recognizing e*);

2 to study whether additional reductions in the coordination arcs in RR Appendix **5 (Rev.WRC-12)** are appropriate for the 6/4 GHz and 14/10/11/12 GHz frequency bands, and whether it is appropriate to reduce the coordination arc in the 30/20 GHz band,

instructs the Director of the Radiocommunication Bureau

to include in his Report, for consideration by WRC-15:

- the results of the ITU-R studies referred to in *resolves* 1 and 2 above;
- statistics on the use of No. **9.41** in respect of coordination under No. **9.7** for the bands identified in *recognizing d*).

ANNEX 1

Possible example of application of No. 11.32A to coordination under No. 9.7 in certain radiocommunication services and frequency bands

One possible alternative to the $\Delta T/T > 6\%$ criterion for triggering GSO-to-GSO coordination is to use more precise criteria in an effort to reduce undue protection requirements stemming from assignments recorded in the MIFR and preventing the successful conclusion of coordination of incoming assignments in their vicinity. This method would consist in a more precise quantification of the probability of harmful interference as referred to in No. 11.32A and should reduce the use of No. 11.41.

This method could be applied, at least initially in applying No. 11.32A, to coordination under No. 9.7 between frequency assignments to geostationary-satellite networks in the fixed-satellite, broadcasting-satellite and mobile-satellite services in the following bands:

- 3 400-4 200 MHz (space-to-Earth), 5 725-6 725 MHz (Earth-to-space), 7 025-7 075 MHz (Earth-to-space);
- 10.95-11.2 GHz (space-to-Earth), 11.45-11.7 GHz (space-to-Earth), 11.7-12.2 GHz (space-to-Earth, Region 2), 12.2-12.5 GHz (space-to-Earth, Region 3), 12.5-12.75 GHz (space-to-Earth, Regions 1 and 3), 13.75-14.5 GHz (Earth-to-space),

Under this method, the Bureau would, in conducting its review under No. 11.32A, consider the probability of harmful interference to be negligible and issue a favourable finding if the power flux-density (pfd) is less than or equal to a prescribed limit.

If the above-mentioned pfd limits are not met, the Bureau would potentially use the relevant Rules of Procedure to determine whether the probability of harmful interference is considered to be negligible or not.

ANNEX 2

Possible application of a different interference criterion to coordination under No. 9.7 in certain radiocommunication services and frequency bands

A second possible alternative to the $\Delta T/T > 6\%$ criterion for triggering GSO-to-GSO coordination is to use more precise criteria in an effort to reduce undue protection requirements stemming from assignments recorded in the MIFR and preventing the successful conclusion of coordination of incoming assignments in their vicinity. This method would consist in using the *C/I* criterion instead of the $\Delta T/T$ criterion when justifying the inclusion of additional affected administrations outside the coordination arc where No. 9.41 is applied. Under this method, the *C/I* level would be calculated in accordance with, for example, the method in Recommendation ITU-R S.741. Networks outside the coordination arc where the *C/I* level is lower than the threshold established would be included as networks with which coordination is needed.

Studies could look at the suitability both of the method for replacing the $\Delta T/T > 6\%$ criterion and of including in the Radio Regulations (for example, in Appendix 8) the methodology for calculation of interference between satellite networks using the *C/I* criterion set out in Section B3 of Part B of the Rules of Procedure, and whether corresponding modifications would need to be made in RR Appendix 5.

RESOLUTION 757 (WRC-12)

Regulatory aspects for nanosatellites and picosatellites

The World Radiocommunication Conference (Geneva, 2012),

considering

- a)* that nanosatellites and picosatellites, commonly described as ranging in mass from 0.1 to 10 kg and measuring less than 0.5 m in any linear dimension, have physical characteristics that differ from those of larger satellites;
- b)* that nanosatellites and picosatellites are satellites which typically have a short (1-2 years) development time and are low cost, often using off-the-shelf components;
- c)* that the operational lifetime of these satellites ranges from several weeks up to a few (< 5) years depending on their mission;
- d)* that nanosatellites and picosatellites are being used for a wide variety of missions and applications, including remote sensing, space weather research, upper atmosphere research, astronomy, communications, technology demonstration and education, as well as commercial applications, and therefore may operate under various radiocommunication services;
- e)* that these satellites are typically launched as secondary payloads;
- f)* that some missions performed with these satellites require the simultaneous launch and operation of several such satellites;
- g)* that, currently, many nanosatellites and picosatellites use spectrum allocated to the amateur satellite service and the MetSat service in the frequency range 30-3 000 MHz although their missions are potentially inconsistent with these services;
- h)* that nanosatellites and picosatellites may have limited orbit control capabilities and therefore have unique orbital characteristics;

i) that the standing Agenda item 7 of WRCs has up to now not led to consideration of regulatory procedures for notifying nanosatellites and picosatellites,

further considering

a) that successful and timely development and operation of nanosatellites and picosatellites may require regulatory procedures which take account of the short development cycle, the short lifetimes and the typical missions of such satellites;

b) that the existing provisions of the Radio Regulations for coordination and notification of satellites under Articles 9 and 11 may need to be adapted to take account of the nature of these satellites,

resolves to invite WRC-18

to consider whether modifications to the regulatory procedures for notifying satellite networks are needed to facilitate the deployment and operation of nanosatellites and picosatellites, and to take the appropriate actions,

invites ITU-R

to examine the procedures for notifying space networks and consider possible modifications to enable the deployment and operation of nanosatellites and picosatellites, taking into account the short development time, short mission time and unique orbital characteristics,

instructs the Director of the Radiocommunication Bureau

to report to WRC-15 on the results of these studies,

invites administrations and Sector Members

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

RESOLUTION 758 (WRC-12)

Allocation to the fixed-satellite service and the maritime-mobile satellite service in the 7/8 GHz range

The World Radiocommunication Conference (Geneva, 2012),

considering

a) that the frequency bands 7 250-7 750 MHz (space-to-Earth) and 7 900-8 400 MHz (Earth-to-space) are allocated worldwide to the fixed-satellite service (FSS);

b) that these bands, or parts thereof, are also allocated worldwide to other services such as the fixed and mobile services, the meteorological-satellite service and the Earth exploration-satellite service (space-to-Earth);

c) that the bands 7 250-7 375 MHz (space-to-Earth) and 7 900-8 025 MHz (Earth-to-space) are also allocated to the mobile-satellite service on a primary basis, subject to agreement obtained under No. **9.21** through No. **5.461**;

d) that some administrations have reported a shortfall of spectrum available for their current and future applications in these bands;

e) that the additional bandwidth requirements for data transmission on these next-generation satellites are estimated to be around a maximum of 100 MHz;

f) that the adjacent bands 7 150-7 250 MHz and 8 400-8 500 MHz are currently allocated to the fixed and mobile services as well as to the space research service (SRS);

g) that in the SRS, the use of the bands 7 145-7 190 MHz (Earth-to-space) and 8 400-8 450 MHz (space-to-Earth) is limited to deep space and that there are currently no space services co-allocated with SRS (deep space) anywhere in the Radio Regulations;

h) that the ubiquitous deployment of small very small aperture terminal (VSAT)-like FSS earth stations is generally not compatible with the protection of the SRS;

i) that the spectrum requirements considered under the maritime mobile-satellite service address operation beyond territorial waters,

noting

the specific provisions of Nos. **5.458**, **5.459**, **5.460**, **5.465** and **5.466**,

resolves to invite ITU-R

1 to conduct technical and regulatory studies on the possible new allocations to the FSS in the frequency bands 7 150-7 250 MHz (space-to-Earth) and 8 400-8 500 MHz (Earth-to-space) in order to ensure compatibility with existing services, with a view to extending the current worldwide allocation to the FSS in the bands 7 250-7 750 MHz (space-to-Earth) and 7 900-8 400 MHz (Earth-to-space);

2 to conduct the appropriate regulatory studies to ensure that any new FSS allocation referred to in *resolves* 1 above is limited to FSS systems operated from a fixed known location in order to enable compatibility with systems of other services, taking into account that the operational requirements in the bands 7 150-7 250 MHz (space-to-Earth) and 8 400-8 500 MHz (Earth-to-space) do not encompass small VSAT-like FSS earth stations;

3 to conduct technical and regulatory studies on the possibility of allocating the bands 7 375-7 750 MHz (space-to-Earth) and 8 025-8 400 MHz (Earth-to-space), or parts thereof, to the maritime-mobile satellite service, while ensuring compatibility with existing services;

4 to complete these studies in time for WRC-15,

invites administrations

to participate actively in the ITU-R studies.

RESOLUTION 909 (WRC-12)

Provisions relating to earth stations located on board vessels which operate in fixed-satellite service networks in the uplink bands 5 925-6 425 MHz and 14-14.5 GHz

The World Radiocommunication Conference (Geneva, 2012),

considering

- a)* that WRC-03 introduced provisions relating to the use of earth stations on board vessels (ESVs) in certain bands allocated to the fixed-satellite service (FSS);
- b)* that the technology used by ESVs has advanced considerably since their introduction, including the use of spread-spectrum modulation and other techniques which may improve compatibility with terrestrial co-frequency services;
- c)* that ESV applications can provide high-bandwidth connectivity in areas where no alternative exists;
- d)* that ESVs may have the potential to cause unacceptable interference to terrestrial services operating in the same bands;
- e)* that earlier ITU-R studies, using technical criteria appropriate at the time, resulted in a set of limitations on the operation of ESVs contained in Resolution **902 (WRC-03)**, in order to protect terrestrial services operating in the same bands;
- f)* that these limitations and restrictions need to be reviewed in light of the new technologies being deployed;
- g)* that there are situations where there is no potential for unacceptable interference but current rules still require that an agreement be obtained from concerned administrations,

recognizing

- a)* that there are several other services than FSS to which the frequency bands 5 925-6 425 MHz and 14-14.5 GHz are allocated;
- b)* that these other services need to be protected,

resolves to invite ITU-R

1 to review the provisions relating to ESVs which operate in the FSS in the uplink bands 5 925-6 425 MHz and 14-14.5 GHz and consider possible modifications to Resolution **902 (WRC-03)** in order to reflect current ESV technologies and technical characteristics that are being used or planned to be used, while protecting the other services referred to in *recognizing a) and b) above*;

2 to complete the referenced studies in time for WRC-15.

RESOLUTION 957 (WRC-12)

Studies towards review of the definitions of *fixed service*, *fixed station* and *mobile station*

The World Radiocommunication Conference (Geneva, 2012),

considering

- a) that the current technological environment for some applications is substantively different from the one which prevailed when the current definitions were established;
- b) that in the study period leading up to WRC-12, studies were undertaken to address fixed and mobile convergence, and that one method proposed to address this was revisions to the definitions of *fixed service*, *fixed station* and *mobile station*;
- c) that regulatory procedures should be continually assessed in order to meet the demands of administrations;
- d) that the review of the definitions in *considering b)* should aim to support the implementation of efficient spectrum management practices and spectrum use,

recognizing

- a) that No. **1003** of the Convention defines *mobile service*;
- b) that Article **1** of the Radio Regulations defines *fixed service*, *fixed station* and *mobile station*,

resolves

- 1 to review the definitions of *fixed service*, *fixed station* and *mobile station* contained in Article **1** for possible modification;

2 to study the potential impact on regulatory procedures in the Radio Regulations (coordination, notification and recording) and the impact on current frequency assignments and other services resulting from possible changes to the definitions referred to in *resolves* 1,

invites ITU-R

to conduct the necessary studies described in *resolves* 1 and 2 in time for consideration by WRC-15, as referred to in *instructs the Director of the Radiocommunication Bureau* below,

invites administrations

to participate actively in the ITU-R studies,

instructs the Director of the Radiocommunication Bureau

to provide the results of these studies in his report to WRC-15 for consideration under agenda item 9.1 (see [Resolution 807 \(WRC-12\)](#)) and appropriate action.

THE INTERNATIONAL AMATEUR RADIO UNION

Since its founding in Paris in 1925, the International Amateur Radio Union (IARU) has been the recognized spokesman for the world amateur radio community. A federation of national amateur radio organisations, the IARU presently has 159 Member Societies representing the same number of countries and separate territories. The IARU has three Regional Organisations that correspond to the three radio Regions defined in the ITU Radio Regulations for the purposes of frequency allocation. The IARU Constitution provides for an IARU Member Society, presently the American Radio Relay League, to serve as the IARU International Secretariat.

The IARU officers are:

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Ole Garpestad (Norway), vice president;
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The regional executive committees are:

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