

**ATTACHMENT 1**  
**to FCC Public Notice DA 09-763**

**Recommendations on draft preliminary views by the Advisory  
Committee for the 2011 World Radiocommunication Conference**

## **Maritime Aeronautical and Radar Services**

## **Document WAC/013(31.03.09)**

### ***WAC Informal Working Group (IWG)-1***

Modifications to NTIA's Preliminary View  
on Agenda Item 1.3 (see WAC/006(13.01.09))

Preparation for ITU Radiocommunication Conferences

#### **UNITED STATES OF AMERICA PRELIMINARY VIEWS ON WRC-11**

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

**ISSUE:** The purpose of this agenda item is to identify spectrum requirements and potentially take regulatory actions, including allocations, to support the safe operation of UASs. The ITU-R is studying sharing and compatibility with existing services already having allocations. This agenda item specifically excludes at WRC-11 the allocation of spectrum for radiocommunications related to payloads on aircraft, but invites the ITU-R to study payload radiocommunication requirements.

**BACKGROUND:** Unmanned aircraft systems (UASs) enable the remote piloting of aircraft over short range and significant distances within or out-of-sight of the remote pilot. These flight operations currently take place in segregated airspace, to ensure the safety of the air vehicle and other airspace users.

Administrations expect broad deployment of UASs throughout the airspace structure. As UAS deployment increases, it will be impractical for some users to deploy in segregated airspace. Some UASs will need to integrate with the current airspace users in a safe and seamless manner. To accomplish integration into non-segregated airspace, UASs will require high integrity communications link(s) between the unmanned aircraft (UA) and remote control centers capable of relaying the necessary air traffic control (ATC) messages and flight critical aircraft information. The UAS pilot will need sense and avoid functions for situational awareness.

The ICAO future communications study may be able to identify technologies with some capacity to meet the requirements for command and control (including the relaying of ATC communications). The aeronautical mobile (R) service (AM(R)S) and aeronautical mobile satellite (R) service (AMS(R)S) are the appropriate services to accommodate command and control and ATC radiocommunications. The ITU-R is examining existing AM(R)S and AMS(R)S allocations for suitable bandwidth prior to studying new allocations.

#### **Command & Control**

In non-segregated airspace, the remote pilot must reliably monitor the status of the UA, pass control instructions to their UA, and interact with the appropriate air traffic controllers monitoring airspace within which their UA is flying. A line-of-sight link might provide these capabilities for

UA flying and maneuvering in a localized area. A combination of a terrestrial radio and satellite network and could provide these capabilities to UA flying trans-horizon.

### **Relay of Air Traffic Control (ATC) Communications**

Safe operation of manned or unmanned aircraft depends on ATC communications. Pilots act based on ATC instructions. When the pilot is remote (not in the aircraft) the pilot and ATC must maintain a voice channel to relay information from a radio in the aircraft to the pilot on ground. Early concepts assume that this function, if digitized, could be part of the command and control links.

### **Sense and Avoid**

The safe flight operation of UA necessitates advanced techniques to detect and track nearby aircraft, terrain, and obstacles to navigation. Unmanned aircraft must avoid these objects in the same manner as manned aircraft. The remote pilot will need to be aware of the environment within which the aircraft is operating, be able to identify the potential threats to the continued safe operation of the aircraft, and take the appropriate action. The radiodetermination service allocations could potentially accommodate the sense and avoid function. The ITU-R is examining existing Aeronautical Radionavigation Service (“ARNS”) allocations for suitable bandwidth prior to studying new ARNS allocations. The UAV industry is studying the suitability of other technologies for sense and avoid.

### **Payload**

The spectrum requirements to support payload communications are not critical to the safe operation of that aircraft. The ITU-R is developing a report or recommendation on how to address UAS payload requirements.

**U.S. VIEW:** If studies identified in Resolution **421 (WRC-07)** support regulatory actions at WRC-11 for the operation of UAS, the United States supports ~~possible modification to use of~~ existing primary AM(R)S and/or AMS(R)S allocations, or, if necessary, new allocations for these two services to support the command and control ~~(and including ATC communications)~~ of UAS in non-segregated airspace. ~~If In connection with studies identified in Resolution 421 (WRC-07), and further ongoing studies to determine suitability of other technologies, substantiate regulatory actions at WRC-11 for,~~ related to the sense and avoid function of UAS, the United States supports ~~possible regulatory modification to use of~~ existing radiodetermination service primary ARNS allocations, or, if necessary, new radiodetermination service allocations based on the satisfactory results of ITU-R studies to that service to support the sense and avoid function of UAS in non-segregated airspace. The United States does not support new allocations for the radiocommunication requirements for UAS payloads. The identification of any frequency band within AM(R)S, AMS(R)S and ARNS allocations, or any new frequency band allocation to these AM(R)S, AMS(R)S and ARNS services for use by the proposed UAS command and control, sense and avoid functions, must ensure the protection of the other co-primary services in that band, and not unduly constrain use of that band by other co-primary services. Development of related ITU-R Recommendations is also supported. (August 27, 2008).

***WAC Informal Working Group (IWG)-1***

**Preparation for ITU Radiocommunication Conferences**

**UNITED STATES OF AMERICA  
PRELIMINARY VIEWS ON WRC-11**

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

**ISSUE:** The **Resolution 420 (WRC-07)** aspect of **WRC-11 Agenda Item 1.4**

**Resolution 420 (WRC-07)** resolves

1. that ITU-R investigate, with priority, AM(R)S spectrum requirements for surface applications in the 5 GHz range, in order to determine if they can be fulfilled in the band 5 091-5 150 MHz;
2. that ITU-R further investigate, if necessary, the feasibility of an allocation for AM(R)S for surface applications at airports, study the technical and operational issues relating to the protection of RNSS in the bands between 5 000 and 5 030 MHz and of the radio astronomy service in the band 4 990-5 000 MHz from AM(R)S, and develop appropriate Recommendations;
3. that WRC-11 consider results of the above studies and take appropriate actions.

**BACKGROUND:**

The RNSS bands in the 1164-1610 MHz range are now reaching a point where little bandwidth remains for new signals. Having foreseen this lack of spectrum for future RNSS applications, the 5000-5010 MHz (Earth-to-space) and 5010-5030 MHz (space-to-Earth) bands were allocated to the RNSS by WRC-2000 and confirmed by WRC-03. The Navstar Global Positioning System (GPS) and other RNSS systems such as QZSS, Galileo and GLONASS are planning to implement RNSS services in these 5 GHz bands. Aside from the congested 1 GHz RNSS bands, the 5000-5030 MHz bands are currently the only ones that remain of practical use to the RNSS and there appear to be no viable future RNSS allocation possibilities.

The introduction of AM(R)S in the 5GHz RNSS bands would rule out the possibility of domestic mobile GPS stations. Such mobile stations may indeed need to operate in and around airports to be effective, and studies have shown that AM(R)S systems might be incompatible with such use. Furthermore, new 5 GHz RNSS applications; e.g., small anti-jam antennas, are made possible due to the shorter wavelength, and the 5000-5030

MHz bands need to be maintained for future GPS development. Since WRC-07, a preliminary GPS service downlink has been designed for the 5010-5030 MHz band and it is expected that this design will evolve over the next few years as technology progresses to more fully take advantage of the potential available.

It appears that the proposed AM(R)S allocations would effectively end future RNSS development of the 5000-5030 MHz bands. If AM(R)S systems were deployed throughout airports worldwide, finding sites for future RNSS terminals, or the use of mobile RNSS terminals would become problematic. As a practical matter, once an AM(R)S system is installed at an airport, it would be difficult to have it modified to accommodate an incoming RNSS system. Since current RNSS applications operate at airports, it would be useful for 5 GHz applications to operate alongside of 1 GHz applications and a significant burden to operate 5 GHz applications several kilometres from airports.

Finally, there is no clear regulatory path to protecting the RNSS from the AM(R)S. The RNSS requires protection, but some proposed regulatory language appears to be insufficient. The clause “not cause harmful interference to, nor claim protection from” would effectively make the AM(R)S Secondary to RNSS. However, due to the safety-service status of the AM(R)S, several serious regulatory questions have been raised. For example, how can the RNSS, which is not normally considered a safety service, claim protection from the AM(R)S? Since the AM(R)S allocation is intended to provide safety at airports, the AM(R)S allocation cannot waive its safety status and there is no easy regulatory fix. Hence RNSS proponents still have yet another strong argument to oppose a new AM(R)S allocation in the 5000-5030 MHz band.

#### **U.S. VIEW:**

In regard to Resolution **420** of WRC-11 A.I. 1.4, until technical and regulatory approaches can be demonstrated to be feasible in these bands, the United States believes there should be no changes proposed to the allocations in the bands 5000-5010 MHz and 5010-5030 MHz.

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**Document WAC/015(31.03.09)**

***WAC Informal Working Group (IWG)-1***

**Modifications to NTIA's Preliminary View  
on Agenda Item 1.9 (see WAC/010(31.03.09))**

**Preparation for ITU Radiocommunication Conferences**

**UNITED STATES OF AMERICA  
PRELIMINARY VIEWS ON WRC-11**

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

**ISSUES:** Appendix **17** outlines the frequencies and channelling arrangements in the high-frequency bands for the maritime mobile service (MMS). During WRC-03, changes to Appendix **17** allowed for the use of digital technology on a no-protection, non-interference basis in certain bands (footnote "p").

WRC-07 modified Resolution **351 (Rev. WRC-07)** to invite WRC-11 to consider necessary changes to Appendix **17** to implement the use of new technology by the MMS with a view to promote efficiency. To this end, the ITU-R tasks are to finalize studies:

1. to identify any necessary modifications to the frequency tables contained within Appendix **17**;
2. to identify any necessary transition arrangements for the introduction of new digital technologies and any consequential changes to Appendix **17**; and
3. to recommend how digital technologies can be introduced while ensuring compliance with distress and safety requirements.

**BACKGROUND:** The ~~future~~ current spectrum needs of the maritime mobile service in the HF bands are now inextricably connected ~~closely related to the introduction of new HF data exchange technologies which now function as an effective alternative standard for narrow-band direct printing (NBDP) for commercial shipping.~~ In the past decade the use of NBDP for commercial communication worldwide, has is in rapidly declined worldwide. The International Maritime Organization (IMO) ~~has noted that NBDP in the past has been mostly used~~ currently is for broadcasting of maritime safety information (MSI), ship reporting, weather forecasts, and for business communications, e.g. by fishing fleets. All these functions are now achieved ~~able~~ by through alternative data communications technology through HF and Satellite transmissions.

The global maritime community has successfully demonstrated that ~~expects to~~ improved the utilization of maritime mobile service spectrum can be achieved by formally adopting ~~allowing the ongoing practice of the usage of~~ data transmissions on a variety of certain Appendix **17** voice channels, NBDP channels and data /fax frequencies previously used primarily for radio

telegraphy, Morse code and facsimile transmissions. ~~This~~ Utilization of spectrum in this manner will provide critical additional flexibility for data exchange services in future.

The ITU and IMO have now had 4 years to ~~will~~ evaluate the HF data service for incorporation into the Global Maritime Distress Safety System (GMDSS). This experience has demonstrated that ~~Additionally, the communication protocols of the HF data service by the ITU and IMO will~~ need to review communication protocols of the HF data service before completely removing the NBDP requirement from GMDSS. HF NBDP remains useful for distress communications in the Polar Regions (sea area A4) where other terrestrial means of communication are ~~no longer~~ less reliable, and ~~there is no coverage from geostationary satellites.~~ Preservation of NBDP is possible can be achieved by using the HF distress and safety frequencies in Appendix **15**. Amendments to RR Appendix **17** may also have consequential impact to RR Appendix **25**.

**U.S. VIEW:** If studies under Resolution **351 (WRC-07)** show that new digital technologies protect existing distress and safety frequencies, and take into account the commercial communication aspect of the HF band use, the United States supports the revision of RR Appendix **17** to accommodate new digital technologies for the maritime mobile service.

## Document WAC/016(31.03.09)

### *WAC Informal Working Group (IWG)-1*

Modifications to NTIA's Preliminary View on  
Agenda Item 1.12 (see WAC/007(13.01.09))

Preparation for ITU Radiocommunication Conferences

#### **UNITED STATES OF AMERICA PRELIMINARY VIEWS ON WRC-11**

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

**ISSUE:** Resolution **754 (WRC-07)**, "Consideration of modification of the aeronautical component of the mobile service allocation in the 37-38 GHz band for protection of other primary services in the band," calls for consideration of the compatibility of the aeronautical mobile service (AMS) with other primary services in the band 37-38 GHz in order to determine appropriate compatibility criteria for inclusion within the Radio Regulations or an appropriate modifications to the Table of Frequency Allocations.

**BACKGROUND:** The band 37-38 GHz is allocated on a primary basis to the fixed, mobile and space research (space-to-Earth) services, and the 37.5-38 GHz portion of this band is also allocated on a primary basis to the fixed-satellite service (space-to-Earth). Space research service (SRS) earth station receivers are being implemented in the 37-38 GHz band to support manned missions, for both near Earth and deep space distances. Use of the wider bandwidth available in the 37-38 GHz band is required to support the increasing data requirements of planned manned missions.

Preliminary analysis within ITU-R Working Party 7B has shown that aeronautical mobile stations (assuming parameters from lower bands) are capable of causing unacceptable levels of interference ~~for~~ significant periods whenever they are within the -line-of-sight of an SRS receiving earth station. In particular, SRS earth station receivers operating in the 37-38 GHz band have a very low interference threshold. Protection criteria applicable to these SRS Earth stations operating with either deep space or non-deep-space missions are contained in ITU-R Recommendations ITU-R SA.1396, ITU-R SA.609, ITU-R SA.1157 and ITU-R SA.1015s. The operation of an aeronautical mobile station exceeding the protection criteria of the SRS for an extended period could jeopardize the success of a manned or scientific space mission. WRC-07 approved this agenda item based on information that no aeronautical mobile systems operate or plan to operate in the 37-38 GHz band.

CITEL proposed this agenda item at WRC-07 with the intent to exclude the AMS from the Mobile Service allocations in the 37-38 GHz band, in order to determine appropriate compatibility criteria, and protect the other services using this band, particularly the space research service. However, subsequent to WRC-07 it was believed that some aeronautical use might be made of this band if the proper precautions were taken to protect the existing services. Preliminary studies using technical and operational criteria for AMS operations in lower bands are not necessarily applicable to future potential AMS use in the 37-38 GHz band. These earlier studies have shown that sharing with traditional AMS systems is not feasible if the AMS systems were to operate in the band. However, since WRC07 adopted this agenda item, the aviation industry is considering several candidate bands, which includes the 37-38 GHz band, for a newly identified airborne application. If studies show this application can operate without exceeding applicable interference thresholds, it may be feasible to establish sharing criteria that protects the other primary services in the band 37-38 GHz.

Resolution **754 (WRC-07)** calls for sharing studies between the AMS and the SRS, fixed service, FSS and MS in the band 37-38 GHz to determine appropriate criteria to ensure the protection of the other primary services from AMS operations in the band 37-38 GHz. FSS system characteristics which may be used in sharing or compatibility studies can be found in Recommendation ITU-R S.1328.

**U.S. VIEW:** The United States supports sharing studies in the band 37-38 GHz to determine appropriate compatibility criteria for the AMS. If the studies show that sharing is feasible with particular AMS applications, support the establishment of sharing criteria that both protects the other primary services in the band 37-38 GHz, as well as allows for such compatible AMS applications. However, if the studies show that sharing is not feasible, support the suppression of the AMS from the 37-38 GHz band.

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**Document WAC/017(31.03.09)**

***WAC Informal Working Group (IWG)-1***

**UNITED STATES OF AMERICA**

**DRAFT PRELIMINARY VIEWS ON WRC-11**

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

**ISSUE:** To determine if any new radiolocation service allocations or applications in a portion of 30-300 MHz, with bandwidth no larger than 2 MHz, are compatible with existing services and applications in these bands

**BACKGROUND:**

Resolution **611 (WRC-07)** asks WRC-11 to determine if any new radiolocation service allocations or applications in a portion of 30-300 MHz, with bandwidth no larger than 2 MHz, are compatible with existing services and applications in these bands. The Resolution recognizes that it is important to ensure radiolocation radars can be operated compatibly with the existing primary services having allocations in the portions of the VHF band. Further, the Resolution states that introduction of new systems in the radiolocation service shall be avoided in the frequency bands 156.4875-156.8375 MHz and 161.9625-162.0375 MHz, which are used by distress and safety applications in maritime mobile service. Among other things, the ITU-R is invited to study the technical characteristics, protection criteria, and other factors to ensure that radiolocation systems can operate compatibly with systems operating in accordance with the Table of Frequency Allocations in services in the 30-300 MHz frequency range band. Working Party 5B is the lead Working Party on this agenda item.

Based on contributions to ITU meetings and other regional groups, it appears that at least one administration is targeting the 154-156 MHz band for a new radar allocation for space-object detection purposes and that another is targeting the 138-144 MHz band for new radar allocations.

The 30-300 MHz band is allocated to and used by a wide variety of services, including the fixed, mobile, Aeronautical Mobile (R), Aeronautical Radionavigation, broadcasting and amateur services. In the United States, the 138-144 MHz band, portions of the 150-174 MHz and the 220-222 MHz bands are available for land mobile radio use. Private land mobile radio systems are used by companies, local, state or federal governments, and other organizations to meet a wide range of communication requirements, including coordination of people and materials, important safety and security needs, and quick response in times of emergency, but are not made available to the general public. A review of the FCC's licensing database for the frequency band 150-174 MHz band shows over 176, 000 active licenses. In the 154-156 MHz band alone, there are over 70,000 active licenses. The United States also has a large number of LMR systems operating in portions of the VHF band that are not part of the FCC licensing database. This frequency band has favourable propagation which allows implementation of systems with fewer base stations and hence a lower overall cost.

Further, in the United States, the bands 50-54 MHz, 144-148 MHz, and 222-225 MHz are allocated to the amateur and amateur satellite services. These bands are heavily populated by a variety of amateur and amateur satellite stations, including, but not limited to, over 9,800 voice repeater systems in these bands. VHF repeater systems are a predominant medium for amateur communications over a short range. These bands are also used by amateurs for simplex, digital, and long-range weak signal communication via terrestrial, satellite, and earth-moon-earth propagation paths.

**U.S. VIEW:** The United States is of the view that before any new radar allocations within 30-300 MHz can be adopted, it needs to be demonstrated that they are compatible with existing services (including land mobile systems and amateur radio systems) and that they would not unduly constrain use of the band by existing services.

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**Document WAC/018(31.03.09)**

***WAC Informal Working Group (IWG)-1***  
**UNITED STATES OF AMERICA**  
**DRAFT PRELIMINARY VIEWS ON WRC-11**

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

**ISSUE:** To determine if oceanographic radar applications in portions of the band 3-50 MHz are compatible with existing services and applications in these bands.

**BACKGROUND:**

Resolution **612 (WRC-07)** asks WRC-11 to consider allocations to the radiolocation service between 3 and 50 MHz, in bands not to exceed 600 kHz each, for the operation of oceanographic radars. The bands are to be determined by ITU-R sharing studies.

Resolution 612 recognizes that oceanographic radars have been operated on an experimental basis for more than 30 years, and that the developers of these experimental systems have made efforts to mitigate interference to other services. Although oceanographic radars operate through the use of ground wave propagation, the spectrum to be considered, particularly below 30 MHz, reliably supports sky wave propagation, the refraction of signals back toward the earth by the ionosphere, enabling long-distance communication. Most of the users of incumbent services below 30 MHz rely on this mode of propagation.

Given the reliance of the mobile, amateur and broadcasting services on sky wave propagation, the widespread geographic location of these services' incumbent users and listeners and near constant use of these services at all times of the day somewhere in the world, sharing with the mobile, broadcast and amateur services would be difficult. Further, the maritime, aeronautical, and standard time and frequency services are incompatible with HF oceanographic radar because of the safety aspects of these services.

**U.S. VIEW:** The United States is of the view that if an allocation to the radiolocation service within 3-50 MHz is to be adopted, compatibility with incumbent services must be demonstrated. Sharing with the maritime, aeronautical, standard time and frequency, broadcasting, and amateur services should be avoided.

## **Terrestrial Services**

**Document WAC/024(31.03.09)**

***WAC Informal Working Group (IWG)-2***

***Modifications to***

***NTIA's Preliminary View on Agenda Item 1.8 (see WAC/007(13.01.09))***

**UNITED STATES OF AMERICA**

**DRAFT PRELIMINARY VIEWS ON WRC-11**

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

**ISSUE:**

The intent of this agenda item is to study compatibility between passive and active services and develop sharing criteria for co-primary active services in bands above 71 GHz. In particular, it is important to study the spectrum requirements for active services for which the technology will be commercially available at a future date. Based on proposals and documentation available at WRC-07 it is likely that some administrations may seek to develop sharing criteria for the radio regulations in the form of pfd limits on space service downlinks.

**BACKGROUND:**

WRC-2000 adopted Resolutions **731** and **732** as part of the conference decisions on the allocation of frequency bands above 71 GHz to the Earth exploration-satellite (passive) and radio astronomy services resulting in an overall rearrangement of the allocation tables in Article 5 of the Radio Regulations. These resolutions became necessary because the ITU-R was not able to fully evaluate for the active services (e.g., fixed, mobile, radiolocation, etc.), the new arrangement of their allocations vis-à-vis the passive allocations or each other. Therefore, the conference decided to adopt these two resolutions providing for further study and possible action in the future when active services technology and emerging requirements become better known. Since that time, millimeter wave spectrum above 71 GHz has become the subject of increasing interest for commercial use due to its unique propagation characteristics and the wide bandwidth available for carrying telecommunications traffic. New technologies are now emerging that offer the possibility of using these higher frequency bands for fixed wireless applications, taking advantage of the wide bandwidths available to support applications such as extremely high speed data transmission (e.g., data rates in the 1 to 10 Gbps range) for short distance (e.g., < 1-2 km). Several administrations have made or are making provisions for such wideband terrestrial fixed wireless applications. In particular, in the United States, the Fixed Service has operational links in the frequency bands 71-76 GHz, 81-86 GHz, 92-94 GHz and 94.1-95 GHz.

In a somewhat unique set of circumstances, WRC-07 did not adopt a Resolution to define this agenda item. Therefore, the definition and scope of the agenda item is unclear.

**U.S. VIEW:**

The United States supports ITU-R studies concerning the fixed service bands between 71 and 238 GHz. The United States supports protection of the existing services allocated within this frequency range.

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## Document WAC/025(31.03.09)

### UNITED STATES OF AMERICA

#### DRAFT PRELIMINARY VIEWS ON WRC-11

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

**ISSUE:** The main issue is to avoid impact on Region 2 services in 790-862 MHz. Although this Agenda Item focuses on Regions 1 and 3, the results of the sharing studies called for could impact on services within the United States or its territories in terms of 1) cross-border frequency use by administrations in Regions 1 and 3 and/or 2) precedents established by using methodologies or characteristics in the studies.

#### **BACKGROUND:**

The transition to digital television is underway in many countries worldwide. The eventual global transition to digital television will make valuable spectrum available for introduction of the next generation wireless services. In the United States, for example, legislation was signed into law requiring all TV broadcasters to switch from analog to digital transmissions by a certain date in 2009. All television stations operating on TV channels 52-69 are required to vacate this spectrum as part of the transition from analog to digital television. This legislation became the catalyst that opened up this spectrum for other uses, including spectrum for commercial mobile systems and for public safety agencies to implement 700 MHz voice and data communications systems. It is important to ensure that possible regulatory solutions developed under WRC-11 Agenda Item 1.17 do not preclude some countries or regions from opportunities to benefit from this transition and, also facilitate global roaming, reduce equipment cost, etc.

At WRC-07, footnotes 5.314, 5.316, 5.316A, 5.316B, and 5.317A that pertain to the band 790-862 MHz were either modified or included in the Table of Frequency Allocations. In Region 1 the 790-862 MHz band was allocated to the mobile service on a primary basis and identified for IMT effective in 2015. In addition, more than 70 countries in Region 1 identified the band for IMT effective immediately. In Region 3, where the band was already allocated to the mobile service on a primary basis, a number of countries also identified it for IMT. While unrelated to WRC-11 Agenda Item 1.17, it is worth noting that WRC-07 also allocated the band 698-806 MHz to the mobile service on a primary basis in Region 2 and identified it for IMT.

Footnote 5.317A, adopted into the Radio Regulations, states:

**5.317A** Those parts of the band 698-960 MHz in Region 2 and the band 790-960 MHz in Regions 1 and 3 which are allocated to the mobile service on a primary basis are identified for use by administrations wishing to implement International Mobile Telecommunications (IMT) See Resolution **224 (Rev.WRC-07)** and Resolution **749 [COM4/13] (WRC-07)**. This identification does not preclude the use of these bands by any application of the services to which they are allocated and does not establish priority in the Radio Regulations. (WRC-07)

Also of note is the GE06 Agreement that contains a plan for digital TV covering frequencies including the 790-862 MHz band in Region 1 and one country in Region 3. The GE06 Agreement also contains provisions for the coexistence between the terrestrial broadcasting service and other terrestrial services, as well as the list of other primary terrestrial services.

Since the sharing studies called for under Agenda Item 1.17 between the mobile service and the other services that are allocated on a primary basis in the 790-862 MHz band were not completed prior to WRC-07, these are called for under Agenda Item 1.17 and are being conducted within the purview of Joint Task Group (JTG) 5-6.

JTG 5-6 will conduct sharing studies to ensure the protection of the services to which the band 790-862 MHz is currently allocated. Adjacent channel interference will be treated within these studies. The results of the studies conducted by the JTG 5-6 will be made available to the relevant ITU-R Working Parties with the view that these Working Parties can develop ITU-R Recommendations and/or Reports, as appropriate, noting that according to its Terms of Reference, JTG 5-6 will not develop ITU-R Recommendations. It also should be pointed out, that at the JTG 5-6 meetings held thus far, interventions by the United States commenting on the methodologies and technical characteristics being considered for study have been discounted for the most part since the United States is in Region 2.

**U.S. VIEW:** The scope of the WRC-11 Agenda Item 1.17 studies is limited to terrestrial services only in Regions 1 and 3 and only in the band 790-862 MHz. The United States is of the view that, there are no bases for any changes to the Radio Regulations pertaining to terrestrial services in the band 790-862 MHz in Region 2. Consequently, the United States is opposed to any proposals to modify Radio Regulations for Region 2 services in the band 790-862 MHz. The U.S. also seeks to avoid undue constraints that may impede worldwide introduction of new telecommunications services in the band 790-862 MHz.

**Document WAC/026(31.03.09)**

***WAC Informal Working Group (IWG)-2***

***Draft Modifications to***

***NTIA's Preliminary View on Agenda Item 1.19 (see WAC/005(13.01.09))***

**UNITED STATES OF AMERICA**

**DRAFT PRELIMINARY VIEWS ON WRC-11**

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

**ISSUE:** Resolution **956 (WRC-07)** calls for studies into the potential need for regulatory measures ~~regarding related to the application of~~ software-defined radio (SDR) technologies and/or cognitive radio systems (CRS), and specifies that the results of these studies should be ~~considered reviewed at WRC-11 for possible action. The resolution also specifies potential issues with cognitive radio systems, including the possible need for a worldwide pilot channel for "harmonization" of such systems.~~

**BACKGROUND:**

Agenda item 1.19 originated from various proposals at WRC-07. One proposal focused on cognitive radio and the possibility of a worldwide allocation for a "cognition supporting pilot channel (CPC)" – essentially, a pilot channel which would provide radio systems with cognitive capabilities with information regarding locally-available radio spectrum. Another proposal suggested more general studies regarding both cognitive radio and software-defined radio technologies. ~~The ITU-R has not reviewed the studies mentioned in Resolution 956 notes that without additional means, it may not be possible for a radio system to discover receive-only usage. Resolution 956 (WRC-07) also notes that some studies indicate the usefulness of having means to assist in the determination of the local spectrum usage, such as wireless or wired access to a database or to other networks.~~

Working Party 1B is the lead ITU-R group on this agenda item and is developing a common understanding of SDR and CRS that is appropriate for all radiocommunication services. Previous ITU-R work on SDR was done in ITU-R Working Parties 5A and 5D (or their predecessors Working Parties 8A and 8F) and resulted in the adoption of Report M.2117 ("Software defined radio in the land mobile, amateur and amateur satellite services"). In addition, in this study cycle, Working Party 5A is developing a new Report entitled "Cognitive radio systems in the land mobile service". The stated scope of this Report, which is currently at the Working Document stage, is to address "the definition, description and application of cognitive radio systems in the land mobile service." The work within WP 5A has focused on SDR/CRS for Land Mobile Services. Other ITU-R Working Parties (including Working Parties 4C, 4A, 7C, and 7D) are pursuing studies of their own on the implications of SDR and CRS use within and/or on the services for which those groups are responsible, and on whether it is

appropriate for technologies or techniques that dynamically search for spectrum to be used in particular frequency bands that are used by receive-only, passive, and/or safety services. In some of these bands, services are fully operational at all times in all locations on Earth and use low-power signals that will be difficult for any device that is designed to determine spectrum usage before operating to detect. In other bands, terminals are capable of operating at any location at any time, making detection both difficult and uncertain.

**U.S. VIEW:** ~~The United States supports ITU-R studies within Working Party 1B on the relevance of regulatory measures for software-defined radio and cognitive radio systems. Relevant ITU-R working parties are conducting technical studies, as noted in Resolution 956 (WRC-07). The United States will participate as appropriate in these studies. The United States does not believe that changes to the Radio Regulations are needed to address these technologies. In particular, ~~the United States does not support regulatory measures leading to allocations, including identification footnotes, for software-defined radio and cognitive radio systems, as these are technologies, each with its own attributes, and not radiocommunication services.~~ With respect to the definitions, description, or characterization of SDR or CRS, there is no need to include a definition of SDR or CRS in the Radio Regulations. In addition, the United States encourages administrations to contribute technical studies to other ITU-R working parties regarding SDR and CRS technologies, their functionalities, the key technical characteristics, requirements, performance, and benefits to the various ITU-R services. As these technologies may also be implemented in license exempt devices, which operate on a non-interference, no protection from interference basis, after being authorized by an administration be used in conjunction with unlicensed/short range device (SRD) systems, it may be important to follow studies on WRC-11 agenda item 1.22 on short-range device SRD systems. (August 7, 2008)~~

## **Document WAC/027(31.03.09)**

### **IWG-2 Views A and B on the US Preliminary View on Agenda Item 1.20**

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

#### **Summary**

Members of IWG-2 considered proposed changes to the existing U.S. preliminary view on agenda item 1.20 contained in Document WAC/007. This preliminary view was developed prior to creation of the WRC Advisory Committee for WRC-11.

After thorough discussion, IWG-2 members were unable to reach agreement on the proposed modifications to the U.S. preliminary view on this agenda item. Consequently, two views on the proposed modifications to the U.S. preliminary view were developed.

View A (contained in Attachment A to this document) is supported by Aerovironment and Stratocomm and reflects the views of these companies. IWG-2 as a whole did not review and approve the text provided in Attachment A.

View B (contained in Attachment B to this document) is supported by SES Americom, Globalstar, Intelsat, ICO, Hughes Network Systems and DIRECTV and reflects the views of these companies. IWG-2 as a whole did not review and approve the text provided in Attachment B.

Beyond the substantive disagreements on the proposed modifications to the preliminary view, IWG-2 did consider two additional points and agreed they should also be conveyed through the WAC to the FCC. Specifically, that any discussion of possible identification of two channels of 80 MHz each in the range 5850-7075 MHz for HAPS gateway links is, under Resolution **734 (Rev. WRC-07)**, addressing possible identification for HAPS within the fixed service, and not identification of spectrum generally within a frequency band; and that there is a need for new electromagnetic compatibility studies for HAPS in the fixed service with respect to all other services with allocations in the particular bands, including other applications in the fixed service.

IWG-2 respectfully submits this document and the attached two Views to the WRC Advisory Committee for consideration.

ATTACHMENT A

View A regarding the US Preliminary View on Agenda Item 1.20

**RATIONALE FOR THE CHANGES TO THE PRELIMINARY VIEW (PV)  
OF THE UNITED STATES REGARDING WRC-2011 AGENDA ITEM 1.20 (HAPS)  
PROPOSED BY AEROVIRONMENT AND STRATOCOMM**

**Executive Summary**

- The current Preliminary View (PV) of the United States on HAPS was adopted before the establishment of the FCC's WAC, without the participation of any proponents of this emerging, commercially oriented, telecommunications technology and with no technical basis or support for its conclusions. As such, it will prevent the implementation and utilization of HAPS systems that would represent a new, desirable and cost-effective option for many countries around the world.
- The fundamental concern with the PV is that it incorporates wording that proposes a completely different and much more restricted regulatory status for HAPS gateway links than is contemplated by Agenda Item 1.20, which states specifically that studies and spectrum identification is to be "in accordance with Resolution 734."
- Specifically, Resolution 734 resolves that the sharing studies should be extended "with a view to identifying....channels... for gateway links...in bands already allocated to the fixed service, *while ensuring the protection of existing services.*" But the existing PV states that "The identification of any spectrum..." *should not constrain the use of [any such spectrum] by any application of the services to which they are allocated.*"
- Those differing statements imply vastly different regulatory regimes:
  - Any identification for spectrum for HAPS restricted to bands already allocated to the fixed service, where provisions of Article 9 for the coordination of satellite and terrestrial services would apply.
  - The use of the words "shall not constrain" implies a much more restricted regulatory regime. It would permit unrestricted expansion of other systems into areas currently being served by HAPS gateway stations. It would be totally unfair and unreasonable, would be detrimental to a HAPS operator and would destroy its business.
- The current PV -- through use of the word "constrain" -- has effectively made the premature, technically unsupported decision that sharing is not possible, not only before any of those studies have been completed, and before ascertaining the levels of interference that might be caused, but even before considering the mitigation techniques that could be taken to reduce any possible interference to acceptable levels.

- The PV should be revised to reflect the exact wording of the resolution:

“The United States supports the studies for potential HAPS identification in the 5 850 – 7 075 MHz band. The identification of any spectrum for HAPS in the 6 GHz band should ensure the protection of existing services in the range 5850-7075 MHz and in adjacent bands.”

## **Introduction**

The establishment of WAC-2011 in January, 2009, is the first time the FCC has sought the views of industry on Preliminary Views (PVs) of the United States for WRC-2011. Therefore, the FCC’s adoption of recommendations for Preliminary Views is one of first impression. Consequently, we urge the Commission to consider each PV on its own merits, that is, de novo, without giving any preference to the PVs that have been adopted by other government agencies.

For the first time ever, the FCC did not establish a WAC for this impending ITU Conference until two full years after the conclusion of the previous Conference, WRC-07, which adopted the Agenda Items that were to be considered at WRC-2011.

This is especially important in the case of WRC-2011 Agenda Item 1.20, on the possible identification of spectrum around 6 GHz for gateway links for High-Altitude Platform Stations (HAPS), the commercial and non-Federal Government implementations of which would clearly fall under the exclusive aegis of the FCC.

Preliminary Views on this Agenda Item were adopted by NTIA and the US State Department before the establishment of the FCC’s WAC and without the participation of any proponents of this emerging, commercially oriented, telecommunications technology.

Following its adoption as a Preliminary View of the United States by the State Department in August, 2008, this PV on HAPS was presented at the September, 2008 meeting of PCC-II of CITELE, the Inter-American Telecommunications Commission. Unless that PV is revised, it will remain the US view at the next meeting of PCC-II in June, 2009.

The crux of our concern with the State Department’s PV is that it incorporates wording that proposes a completely different and much more restricted regulatory status for HAPS gateway links than is contemplated by Agenda Item 1.20, which states specifically that studies and spectrum identification is to be “in accordance with Resolution 734.”

Specifically, Resolution 734 resolves that the sharing studies should be extended “with a view to identifying....channels... for gateway links... *while ensuring the protection of existing services.*” But the existing State Department PV state that “The identification of any spectrum... *should not constrain the use of [any such spectrum] by any application of the services to which they are allocated.*” Those differing statements imply vastly different regulatory regimes as discussed below.

## **Rationale**

Beginning in 1965, the Fixed-satellite service now shares, on a Primary basis, some 19,325 MHz between 3400 MHz and 51.4 GHz with other Primary services (typically the fixed and mobile services)<sup>1</sup>. Successful, efficient use of shared orbit and spectrum, has been made possible over the past 44 years through the use of Article 9 of the Radio Regulations which includes: The principle of First-come, First served; Advance Publication; Coordination and adherence to ITU-R Recommendations and certain other radio Regulations governing power limits and antenna standards, and which take into account the performance requirements and interference susceptibility of all systems using the shared bands.

On the other hand, the use of the words “shall not constrain” implies a much more restricted regulatory regime. The word “constrain” in the Radio Regulations is the antithesis of “to share”<sup>2</sup>. Webster’s New Collegiate Dictionary defines “constraint” as “to confine,” “to hold back,” “to bring into narrow compass.” Those senses are carried over into the Radio Regulations as a term of art. Typically, the word constrain appears in more than 30 of the ITU’s Radio Regulations, as limitations on a radiocommunication service, for example: “The use of band X by service Y shall not impose constraints on service Z” or “Service A shall not constrain the development and use of services B and C in band D.”

Systems in all co-Primary services which have allocations in a band can now expand, extend and develop, but they cannot do so at the expense of previously existing systems in any of the other Primary services. Unrestricted expansion of other systems into areas being served by HAPS gateway stations would be totally unfair and unreasonable, would be detrimental to a HAPS operator and would destroy their business

The sharing studies as envisioned by the ITU-R in Resolution 734 are underway in several countries including the United States, but without waiting for results of those studies, the United States -- through use of the word “constrain” -- has effectively made the premature, technically unsupported decision that sharing is not possible, not only before any of those studies have been completed, and before ascertaining the levels of interference that might be caused, but also before considering the mitigation techniques that could be taken to reduce any possible interference to acceptable levels.

### **HAPS need for Gateway Link spectrum**

Gateway links are essential to connecting HAPS systems with terrestrial based networks for voice, data and video communications and to connect HAPS systems with the PSTN, with cell-phone providers, with world-wide providers of broadband communications and

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<sup>1</sup> As a Primary service, the FSS now shares 19,325 MHz of bandwidth with other co-Primary Services between 3400 MHz and 51.4 GHz, not counting: bands designated exclusively military by the US; those bands designated in the RRs for feeders to other satellite services; and ITU FSS allocations that are Regional rather than world-wide. If 160 MHz were to be identified for HAPS gateway links it would represent 0.0083 of the total, or less than one percent of the total current FSS shared spectrum allocation.

<sup>2</sup> To “constrain” one service in a band used by other services is tantamount to saying “you can use the spectrum as long as we are not using it and you don’t interfere with our use now or in the future “

with television and sound broadcasters, that is, primarily for backhaul-type connectivity and not directly for end-user service links.

**There are two reasons why additional spectrum in the 6 GHz band needs to be identified for HAPS gateway links.**

One reason is the need to identify some additional spectrum for connecting user terminals with HAPS platforms, as in the case with the 47.2 – 47.5 and 47.9 – 48.2 GHz bands: Without the identification of an additional 2 x 80 MHz spectrum in the 6 GHz band, for gateway links, those two, 300 MHz-wide, bands must be used *both* for two-way links between platform and user terminals *and* for two-way links between platforms and gateway stations. That means that the capacity of a HAPS system to serve user terminals would be reduced by about 25%, since 2 x 80 MHz of its limited spectrum would have to be diverted to provide gateway links.

A second, and even more important reason for the identification of additional spectrum for gateway links, is when the spectrum for user-terminal/platform links is not authorized for use as gateway links. That is the case of HAPS platforms serving as base stations for IMT, as permitted by Resolution 221. The S-band frequencies identified in that Resolution are to be used exclusively for transmissions between the HAPS platform “base” station and the cellular telephone users: They cannot be used for the gateway links that would be necessary to connect those calls to the PSTN and for INTERNET access.

Furthermore, the only other spectrum identified for use by HAPS that could be used for gateway links is the 47 and 49 GHz bands. But those bands are severely affected by high-rain-rates and would be unusable or impractical in tropical, humid parts of the world. However, the 6 GHz band now under consideration for gateway links would be quite suitable in such areas and would therefore be helpful in expanding cell phone and other service coverage to parts of the world with such climates that also have poor telecommunications infrastructure.

In both of these cases, in our view, the regulatory status of the gateway links must be the same as that of the platform/user terminal links.

If that was not the case, and systems of other services having allocations in the band identified for gateway links were allowed to expand *without restriction* into the same geographic areas in which gateway stations were already operating, there would be interference between HAPS and those other, new, intruding systems.

Spectrum in the 47.2 - 47.5 GHz and 47.9- 48.2 GHz bands has been identified for use by HAPS since WRC-2000. HAPS are essentially co-Primary with other services in these bands. That means Article 9, with its principle of “first-come, first served” applies and, with it, the procedures for Advance Notice (API) and Request for Coordination (AP4).

If HAPS gateways were required to cease operation to eliminate the interference, the entire HAPS system would be cut off from interconnection with the rest of the world.

With that prospect, it is extremely unlikely that investors and operators would ever implement any HAPS systems.

### **Evolution of the current Preliminary View**

The source of Agenda Item 1.20 is the text of Resolution 734 (WRC-07) which resolved simply:

to invite the ITU-R to extend sharing studies, with a view to identifying two channels of 80 MHz each for gateway links for HAPS in the range from 5850 to 7075 MHz, in bands already allocated to the fixed service, *while ensuring the protection of existing services [emphasis supplied]*.

The Draft PV of the Radio Conference Subcommittee (RCS) [of the IRAC, the Committee within NTIA/Department of Commerce representing government users of the radio frequency spectrum] adopted on August 7, 2008 added a phrase about adjacent bands. It stated:

Identification of any spectrum for HAPS in the 6 GHz band should insure protection of all services in the 5850-7075 MHz band, *as well as in adjacent bands [emphasis supplied]*.

It appears that by retaining the phrase “should insure protection of all services,” the concern of the RCS related only to interference between HAPS gateway links and government allocations in adjacent bands, not to sharing of the HAPS band with other users of that band. Specifically, it is our understanding that the addition of the phrase about adjacent bands was over a concern that emissions from government high-power radars in lower adjacent bands could cause interference to HAPS Platforms or Gateway stations.

We believe that if radars comply with the existing Radio Regulations on out-of-band emissions in conjunction with a small guard band between 5850 MHz and the lowest frequency of any spectrum identified for HAPS gateway stations, there would be no unacceptable interference to HAPS, and we responded to the concern of the RCS by proposing to add the phrase “as well as in adjacent bands” to our revision of the PV.

Our proposed revision of the Preliminary View on HAPS is given in Annex 1.

### **View of other governments and international bodies**

The United States appears to be in a distinct minority of administrations regarding possible identification of 160 MHz of 6 GHz spectrum for HAPS gateway links<sup>3</sup>.

Consider the action relating to the US PV on HAPS taken by International ITU-R Working Party 5C at its November, 2008 meeting. The US contribution, Document USWP 5C/129, “Interference analysis modeling...”, was an extensive, detailed,

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<sup>3</sup> In this regard, the Report of the US Delegation to the 1948, Third Safety-of-Life-at Sea Conference is informative: “Do not press proposals which are clearly impossible of acceptance.” (“The Role of the United States in the International Telecommunication Union and Pre-ITU Conferences,” by Mildred L. B. Feldman, © 1975.

technical document that analyzed sharing between HAPS and other services in the prospective band. At its beginning, this contribution quoted Resolution 734 which called for “ensuring the protection of existing services.” But it then added the following contradictory text -- not just mirroring -- but greatly expanding, the US PV:

“...without unduly constraining the future operations and expansion of FSS, FS and other services.”

That text clearly implies a vastly different regulatory regime than the one used for co-Primary services sharing a band.

The International ITU-R Working Party in Geneva in November 2008 deleted only that statement, while retaining all of the document’s technical contents and restored, verbatim, the language of Resolution 734. It also added the following text:

“Resolution 734, *recognizing h)* also indicates a *potential limit on future deployment of existing services which must be taken into account when examining sharing studies [emphasis supplied].*”

The current views of European Conference of Post and Telecommunications (CEPT) are also representative of international opinion on this issue. As noted in Document WAC/002(13.01.09) with regard to Agenda Item 1.20, the CEPT states that it “agreed to support extended studies, with the aim of *ensuring adequate protection of existing services including conventional fixed service stations.*”

The Asia Pacific Telecommunication Union (APT), long a supporter of HAPS initiatives, can also be expected to oppose any such “without constraining” language. APT was the initiator of the first Regional proposal leading to the need for HAPS gateway links and extension of the former Resolution 734 to call for certain sharing studies above 3 GHz

### **Feasibility of Sharing**

Our revision of the PV does *not* claim that sharing is feasible: HAPS is an application in the fixed service, but it does not have the same interference creating and susceptibility characteristics of typical fixed service systems.

But the adoption of Agenda Item 1.20, by all the nations participating in WRC-07, and its focus on the 5750-7075 MHz band, supports the assumption that studies might well show that sharing *could* be feasible. To conclude that sharing is infeasible before those studies have been completed is not good spectrum engineering or radio-regulatory practice.

This proposal to revise the existing US PV is *not* the place to prove decisively that sharing *is* feasible and practical. But it is a place to provide a likely scenario that indicates that studies could show that sharing would be feasible and practical if coupled with appropriate limitations and restrictions on system technical parameters. Details of interference scenarios involving the Fixed-satellite service and the mitigation techniques that could be employed to reduce such interference are given in Annex 2.

Developers of HAPS technology in the United States and elsewhere in the world are described in Annex 3.

**Decisions at WRC-07 Affecting Radio Regulations Containing the phrase “Shall Not Constrain the Development and Use of...”**

WRC-07 Document 378, A Report from Committee 5 to the Plenary, included a “Report of the Director on the Activities of the Radiocommunication Sector” came to conclusion that Radio Regulations that include the wording “...shall not constrain the development and use...” “is of an operational nature and that no regulatory action is expected from the Bureau.” And further recommends to the Plenary that RRs containing “operational provisions” “do not affect the regulatory status of the services mentioned in these provisions.

Relevant extracts of that Report are given in Annex 4.

**ANNEX 1 (to ATTACHMENT A)**

**REVISION OF THE PRELIMINARY VIEW OF THE US ON  
WRC-2011 AGENDA ITEM 1.20 (HAPS)  
PROPOSED BY HAPS PROPONENTS IWG\_-2**

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

**ISSUE:** Different segments of the 5 850-7 075 MHz frequency band are utilized for fixed, fixed-satellite, and mobile services. Resolution **734 (WRC-07)** resolves to invite ITU-R to extend the sharing studies, with a view to identifying two channels of 80 MHz each for gateway links for HAPS in the range from 5 850 to 7 075 MHz, in bands already allocated to the fixed service, while ensuring the protection of existing services. ~~proposes to study spectrum identification for gateway links for high altitude platform stations in the range from 5 850 to 7 075 MHz. The study effort is to identify two channels of 80 MHz each for gateway links for HAPS in the range from 5 850 to 7 075 MHz, in bands already allocated to the fixed service, while ensuring the protection of existing services.~~

**BACKGROUND:**

~~Previous WRCs efforts (WRC-97, WRC-2000, WRC-2003 and WRC-2007) have undertaken initiatives to examine HAPS types of applications in various frequency bands. Due to the fact that all previous studies were carried out in frequency bands significantly higher than 5 850-7 075 MHz, new electromagnetic compatibility (EMC) studies will have to be initiated and conducted. The EMC studies will have to address HAPS ability to coexist with mobile, fixed satellite services and other applications in the fixed service, as well as with the radiolocation service, which exists in- is allocated in bands adjacent frequency bands. to 5850 MHz and remote sensing systems which operate in the 6475-7075 MHz band under RR No. 5.458. Until those studies are complete, the Regulations governing the use of the two, 6 GHz 80 MHz-wide channels that may be identified for HAPS gateway links cannot be specified.~~

~~Land based and maritime radiolocation systems operate in the lower adjacent frequency band. Fixed, mobile, and fixed satellite systems also operate in the 5 850 7 075 MHz band. Remote sensing systems operate in the 6 475 7 075 MHz band.~~

**U.S. VIEW:**

The United States supports the studies for potential HAPS identification in the 5 850 – 7 075 MHz band. The identification of any spectrum for HAPS in the 6 GHz band should ~~not constrain the use of the 5 850 7 075 MHz band or the adjacent bands by any application of the services to which they are allocated.~~ ensure the protection of existing services in the range 5850-7075 MHz and in adjacent bands.

## **ANNEX 2 (to ATTACHMENT A)**

### **INTERFERENCE AND INTERFERENCE MITIGATION TECHNIQUES**

The following interference paths could exist, between HAPS gateway links the Fixed-satellite service in the 5850-7075 MHz band. Similar paths would exist between those links and other systems in the Fixed service, and many of the same mitigation techniques and technology could be employed to reduce that interference.

**The 775 MHz band from 5850 – 6700 MHz,  
(The FSS is allocated only in the EARTH-TO-SPACE (UP) DIRECTION:  
The following interference paths could exist between HAPS and the FSS:**

HAPS spectrum for Gateway links also in the UP direction

Interference path 1: From HAPS gateway transmitter to FSS space station receiver

Interference path 2: From FSS earth station transmitter to HAPS platform receiver.

With HAPS spectrum for Gateway links in the DOWN direction

Interference path 3: From HAPS platform transmitter to FSS space station receiver;

Interference path 4: From FSS earth station transmitter to HAPS gateway receiver.

**The 375 MHz band, 6700- 7075 MHz,  
The FSS is allocated in both the EARTH-TO-SPACE (UP) and  
SPACE-TO-EARTH (DOWN) DIRECTIONS:  
The following interference paths could exist between HAPS and the FSS**

For FSS in the EARTH-TO-SPACE (UP) direction, same situations as above,  
interference paths: 1, 2, 3 and 4:

For FSS in the SPACE-TO-EARTH (DOWN) direction, with Gateway links in the UP  
direction:

Interference path 5: from HAPS gateway transmitter to FSS earth station receiver and

Interference path 6: from FSS space station transmitter to HAPS platform receiver;

For FSS in the DOWN direction, with Gateway links also in the DOWN direction:

Interference path 7: from HAPS platform transmitter to FSS earth station receiver and

Interference path 8: from FSS space station transmitter to HAPS gateway receiver.

Finally, amending the International Radio Regulations to identify a band for HAPS gateway links does not mean that all of these interference paths will necessarily be created. Note that Administrations can choose which services will be allocated within their own territories, as well as whether any frequencies identified for HAPS in the Radio Regulations may be used there, subject, of course, to the condition that services protected by the International RRs must be protected at the border and in space.)

### **Interference Mitigation Techniques**

Interference path 1 can be mitigated by siting the Gateway station so that its main-beam does not point at a specific FSS space station, and that its sidelobes are greatly reduced in compliance with a standard to be adopted. Aggregate interference from all HAPS gateway stations within line-of-site of an FSS Space station must be considered.

Interference path 2 can be mitigated by orienting the FSS Earth station so that its main beam does not point at the HAPS platform, that its sidelobes are reduced in compliance with a standard to be adopted and that it takes advantage of natural and artificial site shielding.

Interference path 3 can be mitigated by requiring the sidelobe performance of the HAPS platform antennas to be greatly reduced and conform to a standard to be adopted. Aggregate interference from all HAPS platforms within line-of-sight to an FSS Earth station must be considered.

Interference path 4 can be mitigated by siting an FSS Earth station sufficiently far from a Gateway station (receiver), by reducing its antenna sidelobes in the direction of the Gateway station and by taking advantage of natural and artificial site shielding.

Interference paths 5-8 also need to be analyzed since the upper segment of the band, 6700-7075 MHz is also under consideration for use as HAPS gateway links.

## **ANNEX 3 (to ATTACHMENT A)**

### **US AND FOREIGN DEVELOPERS OF HAPS TECHNOLOGY**

There are at least five US companies developing HAPS systems and flight hardware. Several other companies around the world are also developing and promoting HAPS technology.

#### **Aerovironment, Inc.**

Aerovironment, Inc. developed several unmanned, solar-powered aircraft, one of which, Helios, set an altitude record for an airplane in sustained, level flight of over 96,000 feet. Helios also demonstrated its capability to act as a HAPS platform high above a metropolitan area to act as a: cell phone base station; a High-Definition television broadcasting station; and as a provider of two-way broadband communications – all of those services to an unmodified, stock, cell phone or to user terminals equipped with a 12-inch dish.

Aerovironment, a major manufacturer of unmanned aircraft, is also the developer of “Global Observer,” an unmanned, hydrogen-powered airplane that could provide not only the wide variety of telecommunications services listed above, but could provide a multiplicity of functions for state, local and the national government and commercial services, from a high-altitude, loitering aerial platform: optical relay and sensing (crime surveillance, traffic information and control, natural disaster information, etc. etc.) and chemical sensing at all altitudes up to seventy or eighty thousand feet, etc.

#### **StratoComm Corporation**

StratoComm is also a US based company that designs, builds, deploys and operates HAPS based systems for worldwide applications using stratospheric airships as the platform. StratoComm is a world leader and innovator in stratospheric airship and payload design and technology and is developing solutions for numerous customers around the globe. Their current focus is primarily in developing countries for underserved areas and populations.

StratoComm is now engaged in the implementation of a pre-HAPS transitional system, which is intended to provide multi-mode wireless communications to a large part of Cameroon in Africa.

#### **Other High-Altitude Aircraft Programs in the US**

The descriptions of the following programs have been excerpted from Internet websites solely to indicate current HAPS technology developments and do not necessarily imply endorsement of, or agreement with, any other sections of this Attachment or the revision of the PV being proposed by Aerovironment and StratoComm.

#### **Lockheed Martin**

The Lockheed Martin High Altitude Airship (HAA™), an un-tethered, unmanned lighter-than-air vehicle, will operate above the jet stream in a geostationary

position to deliver persistent station keeping as a surveillance platform, telecommunications relay, or a weather observer. The HAA also provides the Warfighter affordable, ever-present Intelligence, Surveillance and Reconnaissance and rapid communications connectivity over the entire battle space. The technology is available now and ready for integration and flight test.

This updated concept of a proven technology takes lighter-than-air vehicles into a realm that gives users capabilities on par with satellites at a fraction of the cost (1 to 2 orders of magnitude less). The HAA will also integrate reconfigurable, multi-mission payload suites. HAA is significantly less costly to deploy and operate and other airborne platforms, and supports critical missions for defense, homeland security, and other civil applications. Its operational persistence eliminates the need for in-theater logistic support. In position, an airship would survey a 600-mile diameter area and millions of cubic miles of airspace.

In April 2008, the HAA program transferred from the Missile Defense Agency to the U.S. Army Space and Missile Defense Command (USASMDC), located at Huntsville, AL. The USASMDC is continuing the development and demonstration of the HAA to align with the USASMDC mission. USASMDC is the Army specified proponent for space, high altitude, ground-based midcourse defense and serves as the Army operational integrator for global missile defense; and conducts mission-related research and development. USASMDC conducts space and missile defense operations and provides planning, integration, control and coordination of Army forces and capabilities in support of U.S. Strategic Command.

The eventual commercial applications of the HAA are just as numerous and just as varied as those proposed by all the developers of HAPS technology and systems around the world.

### **Boeing, Lockheed Martin and Aurora Flight Services**

The “Vulture” a hydrogen-powered high-altitude long-life (five-year) aircraft is being developed under a DARPA contract with Boeing, Lockheed Martin and Aurora Flight Services.

### **Non-US Companies and Organizations**

Other companies active in the development of HAPS systems include Swiss-based Stratxx (with Swiss, German and other participants) and the Russian-based Astelcom, which is in charge of the Russian Ministry Program for development and operation of a HAP network. Siemens, one of the participants in that program, is developing the telecommunications equipment for deployment and operation of wireless broadband networks such as WiMAX (wireless DSL) and UMTS (mobile 3rd generation) and has received authorization for operation in the 1910-1980 and 2110-2170 MHz bands. Japan and South Korea also have

extensive HAPS development programs and the latter two have large research institutions devoted to HAPS technology and system implementation. Sky Station Australia has also a service and potential regional launch program.

HAPS work continues in the HAPCOS group of organizations coordinated by the University of York in the United Kingdom in a program previously funded by the European Union and involving academic and research institutions in several European countries.

Additional interest in HAPS elsewhere in the world was evidenced at WRC-07 by the several countries who added their names to the RRs relating to the use of the 27 and 31 GHz bands by HAPS in Regions 1 and 3 (5.537A and 5.543A): Bhutan, Cameroon, Korea (Rep. of), India, Indonesia, Iran (Islamic Republic of), Japan, Kazakhstan, Lesotho, Malaysia, Maldives, Mongolia, Myanmar, Uzbekistan, Pakistan, the Philippines, Kyrgyzstan, the Dem. People's Rep. of Korea, Sri Lanka, Thailand and Viet Nam. Russia and the CIS (now RCC) have been there since WRC03.

### **REFERENCES**

Lockheed Martin HAA: [www.lockheedmartin.com/products/HighAltitudeAirship/Index.htm](http://www.lockheedmartin.com/products/HighAltitudeAirship/Index.htm)

Google "VULTURE" or go to: [www.aurora.aero/downloads/communications/pdf/apr\\_199.pdf](http://www.aurora.aero/downloads/communications/pdf/apr_199.pdf); [www.the-register.co.uk/2007/10/25/ink\\_storm\\_for\\_hydrogen\\_strato\\_bot\\_runner.up](http://www.the-register.co.uk/2007/10/25/ink_storm_for_hydrogen_strato_bot_runner.up); [www.aviationnews.eu/?p=1832](http://www.aviationnews.eu/?p=1832); and; [www.darpa.mil/TTO/solicit/BAA07-51/VULTURE\\_BAA\\_FINAL.pdf](http://www.darpa.mil/TTO/solicit/BAA07-51/VULTURE_BAA_FINAL.pdf)

**ANNEX 4 (to ATTACHMENT A)**



**EXTRACTS OF DOC 378**

**World Radiocommunication Conference (WRC-07)**  
Geneva, 22 October - 16 November 2007

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**PLENARY MEETING**

**Document 378-E**  
**12 November 2007**

**Chairman, Committee 5**

TENTH REPORT FROM COMMITTEE 5 TO THE PLENARY

(REPORT OF THE DIRECTOR ON THE ACTIVITIES OF THE RADIOCOMMUNICATION SECTOR)

Agenda item 7.1

Committee 5 considered the proposals under Agenda item 7.1 with respect to the Director's Report and came to the following conclusions:

**Issues included in Part 2 of the Director's Report**

**1 Article 5**

**1.1 Application of Nos. 5.219, 5.220 and similar provisions**

Committee 5 agreed to recommend to the Plenary to confirm the Bureau's understanding that, in Nos. 5.219 and 5.220, the wording "... shall not constrain the development and use of ..." is of an operational nature and no regulatory action is expected from the Bureau.

Committee 5 also agreed to recommend to the Plenary to confirm the Bureau's understanding that Nos. 5.286C, 5.392 and 5.532 contain operational provisions that do not affect the regulatory status of the services mentioned in these provisions.....**[unrelated remainder of document, deleted]**.....

Akira HASHIMOTO

Chairman, Committee 5

**ATTACHMENT B**

**View B regarding the US Preliminary View on Agenda Item 1.20**

Proposals made on behalf of HAPS proponents to modify the previously agreed Preliminary View of the United States with respect to Agenda Item 1.20(WRC-11) are opposed by the companies indicated in the cover letter. The HAPS proponents have proposed changes to the Background and the U.S View sections.

These changes are not supported by U.S satellite interests which use and are developing additional uses of the Fixed Satellite Service (FSS) allocations under examination in this agenda item. Opposition to the proposed changes is based on the following:

A. Background

1. There is an implication in the proposed changes that the availability of 2 X 80 MHz in the band 5850-7075 MHz is a foregone conclusion. Such a conclusion may not necessarily be correct given that studies have not been concluded with the incumbent services and associated users in the band.

2. The existing US View on this agenda item was previously considered in a Public Advisory Committee, and subsequently negotiated with the Executive branch through its representatives, and accordingly submitted to the CITEL PCC II which serves as the regional coordinating body for preparation of proposals to World Radiocommunication Conferences (WRC).

B. U.S. View

US satellite interests have a variety of systems operating in the referenced band. In addition, they continue to develop their use of the band based on proven systems and technology. Therefore, any new entrant in the band must not only protect those existing systems, but also not constrain their future development and expansion. In consequence, the existing P.V. should not be modified.

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**Document WAC/028(31.03.09)**

***WAC Informal Working Group (IWG)-2***

***Modifications to***

***NTIA's Preliminary View on Agenda Item 1.22 (see WAC/005(13.01.09))***

**UNITED STATES OF AMERICA**

**DRAFT PRELIMINARY VIEWS ON WRC-11**

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

**ISSUE:** Resolution **953 (WRC-07)** invites the ITU-R to study the emissions from short-range devices (SRDs), and in particular radio-frequency identification devices (RFIDs), inside and outside the ISM bands. ~~It further emphasizes also describes~~ the need to ensure adequate protection of radiocommunication services from SRD emissions.

**BACKGROUND:** Resolution 953 (WRC-07) describes short range devices (SRDs) as radio transmitters or receivers or both that generate and use radio frequencies locally. The Resolution describes ultra-wideband technologies (UWB), radio frequency identification devices (RFIDs) and similar devices as SRDs. The Resolution also recognizes that SRDs, in particular RFIDs, hold promise for an array of new applications that may provide benefits for users. The Resolution requests the ITU-R to study emissions from SRDs, in particular RFIDs, inside and outside the frequency bands designated in the Radio Regulations for ISM applications to ensure adequate protection of radiocommunication services.

Within the United States, a flexible regulatory regime has been implemented in the ISM bands, setting basic technical requirements that facilitate spectrum sharing among license-exempt devices while minimizing constraints on product designs. This regime has led to the implementation of a variety of license-exempt devices, including short-range devices, in the United States, such as cordless telephones, wireless access systems, RFIDs, push-to-talk walkie-talkie like products, alarm systems and baby monitors.

Short-range devices have been studied in the past in both Working Parties 1A and 1B. ~~ITU-R Question 213/1, "Technical and operating parameters and spectrum requirements for short range devices" was adopted in 1997, resulting in Recommendation ITU-R SM.1538, "Technical and operating parameters and spectrum requirements for short range radiocommunication devices", was adopted in 2001. The ITU-R revised this Recommendation in 2003 and in 2006, and work on further revisions continues in Working Party 1B. In addition to discussing technical and operating characteristics, Recommendation ITU-R SM.1538-2 provides the applications, common frequency ranges and the radiated power limits of several administrations' regulatory regimes as guidance. Recommendation ITU-R SM.1538-2 recommends that "these devices should not be restricted more than necessary in their use and should be subject to recognized certification and verification procedures."~~

Resolution **953 (WRC-07)** mentions ultra-wideband systems in *Considerings (b) and (d)*. Such devices have been studied extensively in Task Group 1/8, resulting in the production of four Recommendations: ITU-R SM.1754 (Measurement techniques of ultra-wideband transmissions), SM.1755 (Characteristics of ultra-wideband technology), SM.1756 (Framework for the introduction of devices using ultra-wideband technology) and SM.1757 (Impact of devices using ultra-wideband technology on systems operating within radiocommunication services). Resolution **953 (WRC-07)** notes all of these recommendations in *Recognizing (a)*.

Resolution 953 also recognizes that the International Organization for Standardization (ISO) has developed standards on RFID characteristics. The ISO has developed numerous RFID standards for automatic identification and item management. One standard, known as the ISO 18000 series, covers the air interface protocol for systems used to track goods in the supply chain. Other ISO standards cover RFID devices for diverse uses such as animal tracking, personal identification cards and vehicle toll collection. The primary change in direction between the current Resolution and past work seems to be the focus on the effect of emissions from short range devices in general on radiocommunications, rather than technical characteristics of such devices and regulatory regimes or the emissions from a specific type of device.

**U.S. VIEW:** The United States views the regulation of short-range devices as ~~primarily a~~ national matter. As such, the United States does not believe that changes to the Radio Regulations are needed to address this agenda item. The United States supports studies into the characteristics of short range devices, including emissions and the effects of those emissions on radiocommunication services. (August 7, 2008)

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## Document WAC/029(31.03.09)

### UNITED STATES OF AMERICA

#### DRAFT PRELIMINARY VIEWS ON WRC-11

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

#### ISSUE:

Whether to allocate spectrum on a secondary basis to the amateur service between 415-526 kHz, and, if so, to determine how to protect existing services in the band from harmful interference. The potential impacts to other users in the band should be examined, and whether the spectrum in the secondary allocation needs to be contiguous should be considered.

#### BACKGROUND:

The band 415-526.5 kHz is largely allocated to the maritime mobile and aeronautical radionavigation services with some variances in their allocations between the three ITU Regions. There is a common primary mobile service allocation across all three Regions in the band 495-505 kHz. In Region 2, the primary mobile service allocation extends to 510 kHz.

The band 495-505 kHz had previously been allocated to the mobile service for distress and calling.<sup>1</sup> WRC-07 retained the mobile allocation for the band 495-505 kHz, suppressed the designation pertaining to the distress and calling and added two footnotes: the first<sup>2</sup> limits the use of the band to radiotelegraphy, and the second<sup>3</sup> requests that authorizations for use other than for the maritime mobile service ensure that no harmful interference is caused to this service.

The principal interest of the amateur radio service in this band lies in its unique propagation properties, which are different from those in the 135 kHz and 1800 kHz bands. For example, the band allows for propagation unaffected by ionospheric disturbances and sunspot cycle variations. This characteristic would prove invaluable in the continuing development by radio amateurs of dependable emergency communications. Moreover, new digital radiotelegraphy modes, such as PSK31, PSK63, and QSK63, represent opportunities to bring new technologies to frequencies whose communications capabilities have historically been defined by legacy communications technologies.

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<sup>1</sup> Footnote 5.83 was suppressed at WRC-07:

5.83: The frequency 500 kHz is an international distress and calling frequency for Morse telegraphy. The conditions for its use are prescribed in Articles **31** and **52**, and in Appendix **13**.

<sup>2</sup> 5.82A: The use of the band 495-505 kHz is limited to radiotelegraphy. (WRC-07)

<sup>3</sup> 5.82B: Administrations authorizing the use of frequencies in the band 495-505 kHz by services other than the maritime mobile service shall ensure that no harmful interference is caused to the maritime mobile service in this band or to the services having allocations in the adjacent bands, noting in particular the conditions for use of the frequencies 490 kHz and 518 kHz, as prescribed in articles **31** and **52**. (WRC-07)

Worldwide, the amateur service successfully shares spectrum as a secondary user to the fixed service between 10.100 and 10.150 MHz. In some countries around the world, including the United States, amateurs utilize specific channels between 5.25 and 5.45 MHz as secondary users to the fixed and mobile services. The primary interference avoidance technique on these bands has been a listen-before-transmit protocol, supplemented by appropriate regulatory power limitations. These techniques have led to successful sharing arrangements, which should be replicable at or near 500 kHz.

Footnote 5.82B calls attention to the NAVTEX frequencies at 490 and 518 kHz. Given the safety aspect of NAVTEX transmissions, an amateur allocation should avoid these frequencies.

**U.S. VIEW:**

The United States supports a secondary allocation to the amateur service of up to 15 kHz, and ideally 15 kHz, in this band. The band segment 495-510 kHz is preferred. Protection to incumbent services shall be provided in accordance with footnote 5.82B.

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## **Space Services**

## Document WAC/019(31.03.09)

### UNITED STATES OF AMERICA

#### PRELIMINARY VIEWS ON WRC-11

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

**ISSUE:** No specific aeronautical mobile-satellite (R) service (AMS(R)S) requirements or methodologies for ensuring long term spectrum availability and access to spectrum have been identified in the ITU-R studies.

**BACKGROUND:** WRC-07 considered the matter of long-term spectrum availability for AMS(R)S and as a result adopted Resolution 222 (Rev. WRC-07). Resolution 222 (Rev. WRC-07) invites the ITU-R to conduct, in time for consideration by WRC-11, technical, operational and regulatory studies to ensure long-term spectrum availability for the AMS(R)S including studies of:

- the existing and future spectrum requirements of the AMS(R)S;
- whether the long-term requirements of the AMS(R)S can be met within the existing allocations with respect to No. **5.357A** while retaining unchanged the generic allocation for the mobile-satellite service in the bands 1525 - 1559 MHz and 1626.5 - 1660.5 MHz;
- to determine the feasibility and practicality of technical or regulatory means, other than the coordination process, in order to ensure adequate access to spectrum to accommodate the AMS(R)S requirements;
- to study existing MSS allocations or possible new allocations only for satisfying the requirements of the AMS(R)S for communications with priority categories 1 to 6 of Article **44** (*of the Radio Regulations*) (if it is determined that AMS(R)S requirements cannot be met).<sup>1</sup>

Additionally, ICAO has released for consultation by Member States its draft positions on Agenda Item 1.7. ICAO states:

“Taking into account the results of ITU-R studies, support further regulatory provisions to strengthen AMS(R)S access to the bands 1 545 - 1 555 MHz and 1 646.5 - 1 656.5 MHz including, if required, changes to No. **5.357A**, No. **5.362A** and Resolution **222**”<sup>2</sup> and,

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<sup>1</sup> See generally Int’l Telecomm. Union [ITU], *Use of the Bands 1 525-1 559 MHz and 1 626.5-1 660.5 MHz by the Mobile-Satellite Service, and Studies to Ensure Long-Term Spectrum Availability for the Aeronautical Mobile-Satellite (R) Service*, Resolution 222 (Rev. WRC-07) (2007).

<sup>2</sup> International Civil Aviation Organization [ICAO], *Draft ICAO Position for the International Telecommunication Union (ITU) World Radiocommunication Conference 2011 (WRC-11)*, at A-17

“If the studies identified by Res. 222 (Rev. WRC-07) indicate that the long term needs of AMS(R)S cannot be satisfied in the bands 1 545 - 1 555 MHz and 1 646.5 - 1 656.5 MHz, then support AMS(R)S in other frequency bands through appropriate regulatory provisions.”<sup>3</sup>

ICAO’s Air Navigation Commission and its Council will consider Member State comments and will develop its final position in the second quarter of 2009.<sup>4</sup>

With respect to ITU-R studies called for in Resolution 222 (Rev.WRC-07), ITU-R Working Party 4C (WP 4C) has developed a work plan covering its next four meetings.<sup>5</sup> WP 4C has also developed a PDNR addressing the “Methodology for the estimation of aeronautical mobile satellite (R) service spectrum requirements.”<sup>6</sup> To date, however, there has been no analysis of the inadequacy of the current MSS allocations in 1525 - 1559 MHz and 1626.5 - 1660.5 MHz bands for accommodating AMS(R)S requirements. Additionally, there has been no information or quantitative analysis presented regarding present and future AMS(R)S spectrum requirements.

**DISCUSSION:** After a decade or more of debate, WRC-97 allocated the bands 1525 - 1559 MHz (space-to-Earth) and 1626.5 - 1660.5 MHz (Earth-to-space) to the mobile-satellite service (MSS) to facilitate the efficient use of that spectrum. Formerly, the bands 1530 - 1544 MHz (space-to-Earth) and 1626.5 - 1645.5 MHz (Earth-to-space) were allocated to the maritime mobile-satellite service and the bands 1545 - 1555 MHz (space-to-Earth) and 1646.5 - 1656.5 MHz (Earth-to-space) were allocated on an exclusive basis to the AMS(R)S. Since WRC-97, there has been no evidence that the near or long term requirements of AMS(R)S are not being satisfied within the generic MSS allocations listed above. There is no operational evidence of AMS(R)S requirements going unmet, and at this time there have been no studies completed to suggest a change of the current situation, or to indicate a need to allocate exclusive AMS(R)S spectrum.

**U.S. VIEW:** The United States is of the view that the current provisions in Resolution 222 (REV. WRC-07) *resolves* and the Radio Regulations are sufficient to adequately provide for AMS(R)S and to ensure the long term availability and adequate access to spectrum for AMS(R)S in the 1525 - 1559 and 1626.5 - 1660.5 MHz bands. Consequently, absent ITU-R studies and sufficient justification to the contrary, the United States is also of the view that no changes are required in the Radio Regulations in 1525 - 1559 MHz and 1626.5 - 1660.5 MHz.

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(2008), available at [www.icao.int/anb/panels/acp/repository/DraftPosWRC2011\(nov2008\).doc](http://www.icao.int/anb/panels/acp/repository/DraftPosWRC2011(nov2008).doc) (emphasis in original).

<sup>3</sup> *Id.* (emphasis in original).

<sup>4</sup> The ICAO Aeronautical Communications Panel (ACP) Working Party F is to consider comments received to this Draft ICAO position at its next meeting March 24, 2009.

<sup>5</sup> ITU, *Work Plan for WRC-11 Agenda Item 1.7 (Resolution 222 (Rev. WRC-07))*, Annex 9 to Document 4C/146-E (2008).

<sup>6</sup> ITU, *Working Document Towards a Preliminary Draft New Recommendation ITU-R M.[AMS(R)S SPECTRUM]*, Annex 8 to Document 4C/146-E (2008).

## Document WAC/020(31.03.09)

### **WAC Informal Working Group (IWG)-3 Modifications to NTIA's Preliminary View on Agenda Item 1.11 (see WAC/005 (13.01.09))**

#### **Preparation for ITU Radiocommunication Conferences**

#### **UNITED STATES OF AMERICA PRELIMINARY VIEWS ON WRC-11 AGENDA ITEM 1.11**

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

**ISSUE:** Resolution **753 (WRC-07)**, "Use of the band 22.55-23.15 GHz by the space research service," calls for consideration of sharing between space research service systems operating in the Earth-to-space direction and the fixed, inter-satellite, and mobile services in the band 22.55-23.55 GHz, with a view to consider the inclusion of the sharing criteria within the Radio Regulations and appropriate modifications to the Table of Frequency Allocations in the band 22.55-23.15GHz-

**BACKGROUND:** To support the SRS missions in near Earth orbit, including missions in transit to the moon and at or near the moon, downlink (space-to-Earth) transmissions will operate in the 25.5-27.0 GHz SRS allocation. This 1.5 GHz wide downlink band will be used for both scientific data retrieval and voice/video communication with the Earth. However, there is a need for a companion uplink (Earth-to-space) band to provide the mission data, command and control links for these missions. Due to the potential for many concurrent exploration-related systems and the large bandwidth requirements of these systems, especially those supporting manned missions, it is envisioned that an uplink bandwidth of up to 600 MHz will be needed. Allocating sufficient primary space research service frequency spectrum in the 22.55-23.15 GHz band will provide the space exploration initiatives adequate uplink (Earth-to-space) bandwidth capacity in a band that is paired with the inter-satellite service and thus is a reasonable companion to the primary space research service 25.5-27.0 GHz space-to-Earth band.

The proposed allocation is in a portion of the ISS allocation 22.55-23.55GHz. The part of the allocation above 23.15GHz is in use by the Hibleo-2/2FL satellite system which is Notified, and brought into use some years ago, and is expected to be in operation for years to come.

Resolution **753 (WRC-07)** calls for sharing studies between SRS (Earth-to-space) and the fixed, inter-satellite and mobile services in the band 22.55-23.15 GHz to determine appropriate criteria which will provide for sharing between a new SRS (Earth-to-space) allocation and the existing services in the 22.55-23.15 GHz band. These sharing studies have been initiated in ITU-R Working Party 7B, the responsible group for CPM studies in support of WRC-11 agenda item 1.11. Given the expected high eirp to be associated with the intended application of the proposed Space Research Service it is important that the impact of the unwanted emissions from this application into the part of the ISS band above 23.15GHz be determined to ensure against harmful interference to systems in that part of the allocation.

**U.S. VIEW:** The United States supports this CITELE proposed agenda item to WRC-07 that calls for the study of sharing in the band 22.55-23.15 GHz between potential SRS (Earth-to-space) systems and the systems of the fixed, inter-satellite, and mobile services. The United States supports a new SRS (Earth-to-space) primary allocation in the band 22.55-23.15 GHz taking into account the results of ITU-R studies, including those which apply to unwanted emissions from the envisioned SRS application into the part of the ISS allocation above 23.15GHz.

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## Document WAC/021(31.03.09)

### UNITED STATES DRAFT PRELIMINARY VIEWS ON WRC-11

**WRC-11 Agenda Item: 1.13** to consider the results of ITU-R studies in accordance with Resolution **551 (WRC-07)** and decide on the spectrum usage of the 21.4-22 GHz band for the broadcasting-satellite service and the associated feeder-link bands in Regions 1 and 3;

**ISSUE:** This agenda item is focused primarily on the implementation of the 21.4-22 GHz band for BSS in ITU Regions 1 and 3, however, there is need to establish adequate regulatory protection criteria to mitigate potential interference from Region 1 and 3 BSS to Region 2 Fixed and Mobile Services.

**BACKGROUND:** While the WRC-11 agenda item calls for studies in accordance with Resolution **551 (WRC-07)**, there is an existing ITU-R Resolution **525 (WRC-07)** that addresses interim procedures for the introduction of HDTV systems in the 21.4-22 GHz band in Regions 1 and 3. Resolution **525** was initially adopted at WARC-92, and the text of this Resolution has been modified at subsequent WRCs. The Annex to the English version of Resolution **525 (Rev. WRC-07)** states:

*“All services other than the broadcasting-satellite service (BSS) in the band 21.4-22.0 GHz in Regions 1 and 3 operating in accordance with the Table of Frequency Allocations may operate subject to not causing harmful interference to BSS (HDTV) systems nor claiming protection from such systems.”*

The applicability of this text to services in Region 2 is ambiguous because the English language version of the text is missing two commas around the phrase “*in Regions 1 and 3*”. The French version of Resolution **525 (Rev. WRC-07)**, however, does include the missing commas, thereby indicating clearly that this text applies to services in Region 1& 3 only.<sup>1</sup> In accordance with provision No. **173** of the Constitution, the French version takes precedent.

The intent of WRC-07 with regard to the applicability of Resolution **525 (Rev. WRC-07)** to the services allocated in Region 2 is clarified further by examining the reference to this resolution in the Table of Frequency Allocations. Specifically, the reference to Resolution **525 (Rev. WRC-07)** in Article **5** is made by footnote No. **5.530**. The No. **5.530** provisions however, are applicable only to BSS in Regions 1&3 and do not apply to any service in Region 2 (see No. **5.50** and **5.51**).

It is necessary for WRC-11 to clarify that in the band 21.4-22.0 GHz, the BSS networks in Regions 1&3 do not have a “super-primary” regulatory status vis-à-vis Fixed and Mobile services in Region 2.

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<sup>1</sup> Text from the French language version of the Annex to Resolution **525 (Rev. WRC-07)**

*“Tous les services, autres que le service de radiodiffusion par satellite (SRS), fonctionnant dans la bande 21,4-22,0 GHz, dans les Régions 1 et 3, conformément au Tableau d'attribution des bandes de fréquences peuvent fonctionner à condition de ne pas causer de brouillage préjudiciable aux systèmes du SRS (TVHD), ni de demander à être protégés vis-à-vis de ces systèmes.”*

### **Applicability of No. 9.11 for BSS in Regions 1 & 3 in the 21.4-22 GHz Band**

The coordination requirements in respect to terrestrial services for the BSS systems that were introduced in the subject band prior to 1 April 2007 are explicitly clear. Consistent with the WRC-03 version of Resolution **525** (Rev. WRC-03), these systems are subject to No. **9.11** coordination procedures if the power flux-density at the Earth's surface produced by emissions from a space station, on the territory of any other country, exceeds:

- $-115 \text{ dB(W/m}^2\text{)}$  in any 1 MHz band for angles of arrival between  $0^\circ$  and  $5^\circ$  above the horizontal plane; or
- $-105 \text{ dB(W/m}^2\text{)}$  in any 1 MHz band for angles of arrival between  $25^\circ$  and  $90^\circ$  above the horizontal plane; or
- values to be derived by linear interpolation between these limits for angles of arrival between  $5^\circ$  and  $25^\circ$  above the horizontal plane.

These threshold values for triggering coordination with terrestrial services are consistent with reference power flux density for the BSS values that have been developed and given in Recommendation ITU-R BO.1776. It is important to recognize that the ITU-R BO.1776 is referenced in Resolutions **525** (Rev. WRC-07) and **551** (Rev. WRC-07).

The coordination requirements for the BSS systems in the 21.4-22.0 GHz band introduced after 1 April 2007 in respect to terrestrial services are conflicting and ambiguous. The interim procedures described in the Resolution **525** (Rev. WRC-07) stipulate that before the definitive procedures are established, the BSS in Region 1&3 in the band 21.4-22 GHz are subject to all relevant provisions of Articles **9** to **14** "except No. **9.11**". This exception however, does not comport with the provisions of Resolution **33** (Rev. WRC-03) that provides for the implementation of the BSS systems prior to the adoption of the definitive regulatory provisions in a given band.<sup>2</sup> The *resolves 1* of Resolution **33** (Rev. WRC-03) requires applications of Articles **9** to **14** provisions without any exception. While Appendix **5** mandates the coordination threshold/condition for the BSS in the band 21.4-22.0 GHz in Regions 1&3 with respect to terrestrial services as the bandwidth overlap.

Considering the ambiguity associated with the implementation of this allocation, the U.S. notes that sharing between satellite services in Regions 1 & 3 and terrestrial services in Region 2 can be most simply implemented through a pfd limits regime in Article **21**, Section **V**. In the present case, the pfd values developed and given in Recommendation ITU-R BO.1776 and also applied to the BSS systems that were introduced in the subject band prior to 1 April 2007 could be used as a power flux-density limit that would apply to all BSS systems in region 1&3 for purposes of sharing with the Fixed and Mobile services in Region 2. Such a limit would only apply to BSS satellite networks' beams on the territories of Region 2 countries.

**US View:** The U.S is of the view that, in the band 21.4-22.0 GHz, the terrestrial services of Region 2 and BSS of Regions 1 & 3 have equal regulatory rights and allocation status. The spectrum sharing regulatory procedures to be developed in response to WRC-11 Agenda Item 1.13, with regard to terrestrial services in Region 2, should be based on the principle of equality of right to operate in accordance with No. **4.8**.

In addition, an important inconsistency in the existing regulatory procedures for the BSS in the band 21.4-22 GHz in Regions 1&3 has been identified. Specifically, with regard to applicability of No. **9.11**, the interim procedures of Resolution **525** (Rev. WRC-07) are in conflict with the requirements of Resolution **33** (Rev. WRC-03) and Appendix **5**. The US is of the view that it is imperative to resolve this inconsistency in order to provide the necessary regulatory protection for the terrestrial services in the band 21.4-22 GHz in Region 2. In this regard, US is

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<sup>2</sup> On applicability of Resolution **33** (Rev. WRC-03), see Resolution **525** (Rev. WRC-07), *considering c.*

of the view that BSS of Regions 1 & 3 should comply with the pfd limits specified in Recommendation ITU-R BO.1776 but only on territories of Region 2 countries. The US supports inclusion of appropriate pfd limits in Article **21**, Section **V**.

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## Document WAC/022(31.03.09)

### UNITED STATES DRAFT PRELIMINARY VIEWS ON WRC-11

**WRC-11 Agenda Item: 1.18** to consider extending the existing primary and secondary radiodetermination-satellite service (space-to-Earth) allocations in the band 2 483.5-2 500 MHz in order to make a global primary allocation, and to determine the necessary regulatory provisions based upon the results of ITU-R studies, in accordance with Resolution **613 (WRC-07)**;

**ISSUE:** This agenda item invites the ITU-R to conduct appropriate studies to determine whether a global primary allocation for the radiodetermination-satellite service is compatible with other services using the 2483.5 – 2500 MHz band.

**BACKGROUND:** The 2483.5-2500 MHz band is currently allocated, globally on a Primary basis, to fixed, mobile and mobile-satellite services. In addition, in Regions 2 and 3 there are Primary allocations to the radiolocation service with a Secondary allocation to that service in Region 1. The radiodetermination-satellite service is allocated on a Primary basis in Region 2 and on a Secondary basis in Region 1, in the space-to-Earth direction. Footnote 5.400 grants a Primary allocation to the radiodetermination-satellite service, in the space-to-Earth direction, to a number of countries in Regions 1 and 3 subject to coordination under No. **9.21**.

The 2483.5 – 2500 MHz band is used by the mobile-satellite service, in the space-to-Earth direction, to provide communication service to remote and underserved locations. This allocation was made at the 1992 World Administrative Radio Conference with systems being designed and implemented by 1998. Service to these remote and underserved areas is critical to their continued development and, often times, represents the only means of communication available in these areas.

In other parts of the world, fixed and mobile services are active in the 2483.5 – 2500 MHz band. In particular, 2496-2690 MHz is used by advanced terrestrial wireless services in the United States.

It is imperative to limit any interference to the Primary services operating in this band.

Currently, the radiodetermination-satellite service is active, in the 2483.5 – 2500 MHz band, only from geostationary space stations serving parts of Region 3. It is uncertain at this time whether RDSS operation has had any effect on the other Primary allocated services.

**U.S. VIEW:** The USA is of the view that a global Primary allocation to the Radiodetermination-Satellite Service (RDSS) in the 2483.5 – 2500 MHz band may be feasible if the following conditions are met:

- 1) that ITU-R studies show conclusively that the operation of RDSS systems would not unduly constrain the operation and expansion of currently allocated services in the 2483.5 – 2500 MHz band;
- 2) that RDSS usage would never seek protection as a safety-of-life application and that the provisions of No. **4.10** would not be applicable in the 2483.5 – 2500 MHz band;

3) that amendments are made to the Radio Regulations, as necessary, to ameliorate any constraints on currently allocated services by the operation of the RDSS in the 2483.5 – 2500 MHz band.

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## **Document WAC/023(31.03.09)**

### **UNITED STATES DRAFT PRELIMINARY VIEWS ON WRC-11**

#### **A.I. 1.25 to consider possible additional allocations to the mobile-satellite service in accordance with Resolution 231 (WRC-07)- Additional allocations in the mobile satellite service with focus on the bands between 4 GHz and 16 GHz**

**ISSUE:** As allocations in the range of interest are fully in use by a variety of services other than the mobile satellite service, the issue is to what extent and under what conditions, both technical and regulatory would it be possible to add the mobile satellite service to an allocation,

#### **Background**

Working Party 4C is the lead ITU-R Working Party for developing information related to Agenda Item 1.25 (WRC-11). It initiated this activity through a set of Liaison statements to other working parties requesting information on certain spectrum allocations of interest. The bands of interest were those which were potential candidates for additional Mobile Satellite Service allocations.

WP-4C has received responses from WP-4A(4C/154), WP-5A(4C/169), 5B(4C/164), WP-5C, WP-5D(4C/153), WP-7B(4C/150) , WP-7C(4C/157), WP-7D(C/148). In the Liaison from WP-4C certain bands were identified which were related to the services under the responsibility of the Working Parties to which they were sent. It was understood by these groups that these were the only bands that were of potential interest. In all cases the bands identified were being extensively used and would appear to present difficult sharing with the addition of a Mobile Satellite Service (MSS).

While a number of responses provide characteristics of services in the bands identified, they indicate a lack of knowledge of characteristics of MSS systems which were intending to use them. Such information was requested.

The Liaison Statements from the Working Parties also include reference to various protection criteria and related ITU-R Recommendations which are related to the services in the bands for which information was requested. These have been developed to provide for the sharing of the allocations by the services in the band whether of the same service or other services. It is apparent that if an MSS allocation were to be added to any of the allocations concerned they would need to conform to the referenced criteria.

There are no “clean” allocations. Therefore, the only allocations which could be used by the MSS would be those where it could be demonstrated that the intended applications would conform to the protection, and sharing criteria associated with the services already using the allocations.

## **Preliminary View**

The following Preliminary Views can be stated:

1. The extent of use of the allocations of interest to the MSS under this agenda item is currently being established in the ITU-R.
2. The use of these allocations of interest have associated with them protection and sharing criteria which are applicable to the services already in the band.
3. The characteristics of potential MSS uses are not known.
4. An MSS allocation could be accommodated in any of the bands of interest, where compatibility studies, agreed upon by the relevant working parties taking into account the applicable protection criteria of the existing services in the band, demonstrate that sharing would be feasible.

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## **Regulatory Issues**

## Document WAC/030(31.03.09)

### WAC Informal Working Group (IWG)-4 Modifications to NTIA's Preliminary View on Agenda Item 1.6 (see WAC/005 (13.01.09))

#### Preparation for ITU Radiocommunication Conferences

#### UNITED STATES OF AMERICA

#### DRAFT PRELIMINARY VIEWS ON WRC-11

**AGENDA ITEM 1.6:** to review No. **5.565** of the Radio Regulations in order to update the spectrum use by the passive services between 275 GHz and 3 000 GHz, in accordance with Resolution **950 (Rev.WRC-07)**, and to consider possible procedures for free-space optical-links, taking into account the results of ITU-R studies, in accordance with Resolution **955 (WRC-07)**<sup>1</sup>

**ISSUE:** The purpose of Resolution **950 (Rev. WRC-07)** is to review No. **5.565**, excluding frequency allocations, in order to update spectrum use between 275 and 3 000 GHz by the passive services. Currently, No. **5.565** describes the need for passive observations of spectral line emissions and spectral windows in various bands throughout the 275 – 1 000 GHz range by the radio astronomy service (RAS), the Earth exploration-satellite service (passive) (EESS), and the space research service (passive) (SRS). The footnote also describes the potential for additional spectral line and continuum bands in this range to be identified in the future. Resolution **950 (Rev. WRC-07)** extends its range of consideration to 275 – 3 000 GHz for RAS, EESS (passive), and SRS (passive) use, and invites ITU-R to conduct studies toward modifying No. **5.565**.

**BACKGROUND:** The current Table of Frequency Allocations establishes allocations at frequencies between 9 kHz and 275 GHz. No allocations presently exist above 275 GHz, although an entry in the Table for the range 275 – 1 000 GHz contains a reference to No. **5.565**:

***5.565** The frequency band 275-1 000 GHz may be used by administrations for experimentation with, and development of, various active and passive services. In this band a need has been identified for the following spectral line measurements for passive services:*

- radio astronomy service: 275-323 GHz, 327-371 GHz, 388-424 GHz, 426-442 GHz, 453-510 GHz, 623-711 GHz, 795-909 GHz and 926-945 GHz;
- Earth exploration-satellite service (passive) and space research service (passive): 275-277 GHz, 294-306 GHz, 316-334 GHz, 342-349 GHz, 363-365 GHz, 371-389 GHz, 416-434 GHz, 442-444 GHz, 496-506 GHz, 546-568 GHz, 624-629 GHz, 634-654 GHz, 659-661 GHz, 684-692 GHz, 730-732 GHz, 851-853 GHz and 951-956 GHz.

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<sup>1</sup>This preliminary view only addresses the first part of the agenda item (passive services between 275 – 3 000 GHz), hereafter referred to as Agenda Item 1.6 (Res 950). The second part of the agenda item (free-space optical links), referred to as Agenda Item 1.6 (Res 955), is addressed in a separate document.

*Future research in this largely unexplored spectral region may yield additional spectral lines and continuum bands of interest to the passive services. Administrations are urged to take all practicable steps to protect these passive services from harmful interference until the date when the allocation Table is established in the above-mentioned frequency band. (WRC-2000)*

Passive services currently utilize portions of the 275 – 3 000 GHz range for scientific observation of both spectral line and continuum emissions. Resolution **950 (Rev. WRC-07)** resolves to review No. **5.565** to update the spectrum use between 275 and 3 000 GHz by the passive services, but specifically excludes allocations in this range, taking into account future long-term requirements for active services.

**U.S. VIEW:** The United States supports the modification of No. **5.565** to include all appropriate bands of interest to RAS, EESS (passive), and SRS (passive) in the range 275 – 3 000 GHz based upon studies being conducted in Study Group 7. In updating Resolution **950 (Rev. WRC-07)**, the future long-term requirements of active services should be taken into account. (~~August 7, 2008~~February 23, 2009)

## Document WAC/031(31.03.09)

### UNITED STATES OF AMERICA

#### DRAFT PRELIMINARY VIEWS ON WRC-11

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

**ISSUE:** List of networks with which coordination needs to be effected (No. 9.36 of RR)

**BACKGROUND:** The regulations currently in force - namely provisions Nos. **9.36** and **9.36.2** – indicate that the Bureau, when it examines a request for coordination in application of Nos. **9.34** – **9.38**, shall identify any administration with which coordination may need to be effected.

Provision No. **9.36.2** further specifies that *“in the case of coordination under Nos. 9.7, 9.7A and 9.7B, the Bureau shall also identify the specific satellite networks or earth stations with which coordination needs to be effected. In the case of coordination under No. 9.7 the list of the networks identified by the Bureau under No. 9.27 is for information purposes only, to help administrations comply with this procedure.”*

In this context, for sake of discussion assume that the coordination request of a network of administration A has been published and that administration B has been identified by the Bureau under No. **9.7** as one of the administrations with which coordination has to be effected.

As the list of the satellite networks of administration B provided by the Bureau is “for information purposes only”, administration A will not necessarily know the complete list of networks of administration B that have to be considered until bilateral coordination between A and B is conducted. This is not desirable, especially because detailed coordination is often conducted between operators, whereas satellite networks are submitted to the ITU by administrations. Operator-to-operator coordination agreements are subsequently ratified by the administrations involved and a formal coordination meeting between administrations may never happen. Therefore the operator of administration A associated with the satellite network under consideration may never know the complete list of networks of administration B with which coordination is required.

Provision No. **9.36.2** stipulates that the Bureau identifies the satellite networks with which coordination needs to be effected in the framework of the coordination procedure foreseen in Article 9 (Section II) for the coordination forms **9.7** to **9.7B**. The Bureau uses for this identification either the “coordination arc” (CA) concept or the method described in Appendix 8 ( $\Delta T/T > 6\%$ ). On the above basis, the BR establishes the list of affected administrations (No. **9.36**) and a list of satellite networks which may be affected by the network contained in the “incoming” coordination request. The latter list, however, may not be complete or definitive for a given coordination request. Under the provisions of No. **9.41** the administrations which are not included in the list under No. **9.36** may request their inclusion in this list, identifying networks outside the coordination arc for which the value of  $\Delta T/T$  calculated by the method in Appendix 8 exceeds 6%.

In addition, administrations which are included in the list of **9.36** may at a later time request that, in addition to the networks included in the list of No. **9.36.2**, other networks should also be included in the coordination process. The latter case does not seem to be covered by the provisions of No. **9.41** which treats only cases of administrations not included in the first list established under No. **9.36** rather than the networks. Consequently, this problem needs to be solved by the administrations during bilateral coordination discussions. A further difficulty is that the additions under No. **9.41** to the list of the affected administrations can only be handled by addenda to the BR first publication under No. **9.38** at different times, after the first publication (see Nos. **9.41** and **9.42**). While the additionally affected administrations are in this way published and consequently known by all the administrations after the 4 month comment period, the complete list of networks to be considered is not available, as the list of networks originally published under No. **9.36.2** is not updated.

Having experienced the above difficulties, a Rule of Procedure (RoP) concerning the application of Provisions Nos. **9.41** and **9.42** has been established. This RoP is attached to the present document for information. (Annex 1). The RoP recognizes that under the current regulations the list of affected networks (No. **9.36.2**) cannot be considered as exhaustive. In addition, it is also recognized that when administrations disagree on the list of networks to be considered the problem can only be solved by the Bureau at the very end of the notification process (Article **11**, Nos. **11.32A**, and probably **11.41**)

It is noted that the wording of No. **9.41** excludes from its application those administrations which have been selected for inclusion in the list of affected administration under No. **9.36**. These administrations may also find that some of their networks which were not included in the list of No. **9.36.2** – since they were outside the coordination arc – should be included into the coordination procedure as their  $\Delta T/T$  value exceeds the threshold value of 6%. Logically for these administrations the concept of No. **9.41** should also apply. The current Rule of Procedure on Nos. **9.41** – **9.42** recognizes this problem (see §.2.1 of the RoP in Annex 1) and suggests that such cases should be considered under No. **9.52** (disagreement communicated to the initiating administration). For such a case the Rule states that the administration should, “*while applying No. 9.52 and without having to apply No. 9.41, bring into the bilateral coordination discussion any of their networks located outside the coordination arc which meet the  $\Delta T/T > 6\%$  criterion.*”

In view of the above considerations, it seems logical and necessary to open the application of the concept of No. **9.41** also for those administrations which have already been identified as affected administrations under No. **9.36**, to allow for the possible addition of networks which were not identified under No. **9.36.2** where the only criterion applied was the coordination arc.

In summary, an improvement to the process would be for the list of networks identified under No. **9.36.2** with respect to coordination under No. **9.7** to be considered provisional and not “for information only”. Currently, according to No. **9.41**, within the period of four months following the publication of a coordination request, administrations are able to request that an administration be added or removed from the list generated by the Bureau. In an improved process, this possibility would be expanded so that requests could also be made to add or remove networks from the list generated by the Bureau.<sup>1</sup> The Bureau would then study all these requests (see No. **9.42**) and subsequently publish, at the earliest possible date, a definitive list of administrations and corresponding satellite networks with which coordination would be required.

Consequential changes to Article 9 and Appendix 5 of the Radio Regulations will be required in order to implement these proposals.

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<sup>1</sup> Requests for addition of an administration should also include the specification of the networks of this administration to be considered in the coordination.

**U.S. VIEW:** The United States is of the view that changes to Article 9 and Appendix 5 of the Radio Regulations are required in order to allow that a definitive list of administrations and corresponding satellite networks with which coordination needs to be effected be generated as early as possible in the coordination process.

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## Annex 1

### Extracts from the Rules of Procedure

9.41 – 9.42

1 The Board has closely studied the situation and the reasons that led to the adoption of the coordination arc (CA) principle at WRC-2000 and in particular Nos. **9.41** and **9.42**. In doing so, it was guided by *recognizing* and *considering* of Resolution **55 (WRC-2000)**, by Article **9** in general, and by Nos. **9.36**, **9.36.2** and Appendix **5**.

2 The Board has accordingly arrived at the following conclusions regarding the application of the provisions of No. **9.41** by an administration which considers that its name should have been identified under No. **9.36** in the context of a request for coordination stemming from the application of No. **9.7** (including for cases not having to do with application of coordination arc):

2.1 Once an administration has been identified and included in the coordination requirements of a particular assignment published in a coordination special section, coordination is to be effected between administrations (not between networks) who decide, based on Appendix **5**, which networks they wish to take into account in their bilateral discussions. The list of satellite networks published under No. **9.36.2** is intended for information purposes only, and thus should not be considered as exhaustive. Administrations identified on the basis of CA can, while applying No. **9.52** and without having to apply No. **9.41**, bring into the bilateral coordination discussions any of their networks located outside of the coordination arc which meet the  $\Delta T/T > 6\%$  criterion. In this case, no action is undertaken by the Bureau under No. **9.42**.

2.2 Administrations not identified by CA are entitled, based on the  $\Delta T/T > 6\%$  criterion, to be included in coordination, in application of Nos. **9.41** and **9.42**. Requests under No. **9.41** must be substantiated by  $\Delta T/T > 6\%$  calculations. To minimize the administrative burden on the Bureau and administrations, it shall be deemed sufficient for an administration wishing to be added in a coordination request under No. **9.41** to provide  $\Delta T/T > 6\%$  calculations for only one pair of assignments for each satellite network to be further considered in the coordination process (a pair consisting of one assignment of the published network and one assignment of the network of the requesting administration); the Bureau will then examine all assignments of the specific networks of the requesting administration and then establish coordination requirements for all the assignments of the network referred to in the publication vis-à-vis the requesting administration under No. **9.42** commensurate with the results of such examination.

3 In case of continuing disagreement between the administration of the published network and an administration involved in coordination under Nos. **9.7** or **9.42**, which cannot be resolved between them at coordination stage, the two administrations may communicate to the Bureau a mutually agreed list of networks to be taken into account for examination under No. **11.32A** at notification stage. If the two administrations cannot agree on such a list, the Board decided that examination under No. **11.32A** at notification stage will be carried out with respect to all networks of the latter administration, indicated in application of § 2 of this Rule, whose assignments, identified in accordance with § 1 of Appendix **5**, have  $\Delta T/T$  greater than 6%.

## Document WAC/032(31.03.09)

### UNITED STATES OF AMERICA

#### DRAFT PRELIMINARY VIEWS ON WRC-11

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

**ISSUE:** Application of Nos. 9.51 and 9.52 with respect to coordination under No. 9.7

**BACKGROUND:** For sake of discussion assume that the coordination request of a network of administration A has been published and that administration B has been identified by the Bureau under No. 9.7 as one of the administrations with which coordination has to be effected.

Then, according No. 9.51, administration B, within four months of the publication of the coordination request, shall “either inform the requesting administration of its agreement or act under No. 9.52”, with the latter meaning that administration B will express its disagreement, i.e. the need for coordination.

In the vast majority of cases, administrations respond in accordance with No. 9.52 without providing any reasons for their disagreement. It is certainly the easiest and safest way to proceed.

It follows from the above that the required formal answer under Nos. 9.51 or 9.52 has lost its value in the framework of GSO to GSO coordination. An improvement to this aspect of the process can be realized by lifting the mandatory nature of this requirement for coordination requests made under No. 9.7 (GSO vs. GSO).

In an improved process, after the coordination request of a satellite network of administration A is published together with the initial list of administrations and corresponding provisional list of satellite networks with which coordination has to be effected, administrations would review this list. In case an administration wants to add or remove itself and/or a network, then it would send this request to the Bureau, as well as to administration A, within four months of the date of publication of the coordination request. However, if an administration agrees with the initial list of administrations and provisional list of corresponding networks published by the Bureau, no action would be required. In particular, an administration already included in the list would not be removed from the final list due to lack of response under No.9.52 as such lack of a response would be understood by the Bureau to mean that this administration believes that coordination with one or more of its networks is required. Removing the requirement to respond under No. 9.52 will eliminate a significant amount of correspondence that in most cases does not contribute in any way to expedite coordination process.

Consequential changes to Article 9 of the Radio Regulations will be required in order to implement these proposals.

**U.S. VIEW:** The United States is of the view that changes to Article 9 of the Radio Regulations are required so that: (1) if an administration, in respect to a coordination request from another administration, is not in a position to give its agreement under No. **9.51** then this administration would not need to respond to such a request; and (2) the lack of such a response would be understood by the Bureau to mean that this administration believes that coordination with one or more of its networks is required.

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