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UNITED STATES DEPARTMENT OF COMMERCE
National Telecommunications and Information Administration
Washington, D.C. 20230

AUG 28 2008

Ms. Helen Domenici
Chief of the International Bureau
Federal Communications Commission
445 12th Street SW
Washington, D.C. 20554

Dear Ms. Domenici:

The National Telecommunications and Information Administration (NTIA), on behalf of the Executive Branch agencies, approved the release of a package of draft Executive Branch preliminary views for 2011 World Radiocommunication Conference (WRC-11). These draft preliminary views consider the Federal agency inputs toward the development of U.S. proposals for WRC-11. The enclosure contains preliminary views for the following agenda items:

a) Agenda Item 1.3 - Unmanned Aircraft Systems;

b) Agenda Item 1.4 - Aeronautical Mobile (R) Service at VHF/UHF/SHF; and

c) Agenda Item 1.21 - Radiolocation Service at 15.4-15.7 GHz.

This package is forwarded for your consideration and review by your WRC-11 Advisory Committee. Darlene Drazenovich of my staff is the primary contact for NTIA.

Sincerely,

Karl B. Nebbia
Associate Administrator
Office of Spectrum Management

Enclosure

Radio Conference Subcommittee (RCS)
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 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 existing 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 ATC communications of UAS in non-segregated airspace. If studies identified in Resolution **421 (WRC-07),** and further ongoing studies to determine suitability of other technologies, substantiate regulatory actions at WRC-11 for the sense and avoid function of UAS, the United States supports possible modification to existing radiodetermination service allocations, or, if necessary, new allocations 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. (August 27, 2008)

Radio Conference Subcommittee (RCS)

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: WRC-11 agenda item 1.4 includes for the completion of studies listed in Resolutions **413 (WRC-07)** and **417 (WRC-07)**, and any additional regulatory measures that might be required to facilitate the introduction of new aeronautical mobile (route) service (AM(R)S) systems in the bands 112–117.975 and 960–1 164 MHz. The agenda item includes, under Resolution **420 (WRC-07),** for a new allocation to AM(R)S in the frequency band 5 000-5 030 MHz for surface applications at airports, provided that the radionavigation-satellite service (RNSS) in the 5 000-5 030 MHz band and the radio astronomy service (RAS) in the adjacent 4 990-5 000 MHz band are protected. The ITU-R will determine if the spectrum requirements for these new applications can be fulfilled in the 5 091-5 150 MHz band. Resolution **417 (WRC-07)** calls for compatibility studies between ARNS and AM(R)S systems in the 960-1164 MHz band. ITU-R studies do not exist for the 1024-1164 MHz scenario. The ITU-R needs to conduct studies in the 1024-1164 MHz band, based on the conditions outlined in Resolution **417 (WRC-07)**, as the sharing environment below and above the 1 024 MHz band is different.

BACKGROUND: WRC-07 made or modified AM(R)S allocations to support the aeronautical Future Communications System (FCS). In particular, WRC-07 modified the AM(R)S allocation in the band 112 – 117.975 MHz and allocated the band 960 – 1 164 MHz to the AM(R)S, in accordance with Resolutions **413 (WRC-07)** and **417 (WRC-07)** respectively. The resolutions specify regulatory restrictions on the operation of AM(R)S in those bands, limiting systems to those meeting International Civil Aviation Organization (ICAO) standards (i.e., 'systems operating in accordance with international aeronautical standards'). ICAO will address compatibility of the AM(R)S with ICAO standardized systems. The ITU-R will address compatibility with in-band and adjacent band non-ICAO systems identified in the resolutions.

The United States has approved plans for the next-generation Global Positioning System (GPS) use of the 5 010-5 030 MHz band for tracking, telemetry, and command (TT&C) functions. Internationally, both the 5 000-5 010 MHz and 5 010-5 030 MHz bands are contained in specifications for TT&C links. Initial studies have shown that compatibility between planned AM(R)S and RNSS feeder links in the 5 000-5 010 MHz band is feasible under worst case conditions. For RNSS feeder links in the 5 010-5 030 MHz bands, separation distances are required, the extent of which will be determined based on ITU-R defined AM(R)S and RNSS system characteristics. These separation distances are between the TT&C stations and airports,

and may be a viable solution depending upon results of studies. Though all current GPS TT&C stations are fixed, it is possible that in the future: 1) GPS TT&C stations may be transportable and 2) TT&C stations may need to be located near an airport.

The United States is providing preliminary design parameters to ITU-R WP4C for proposed GPS service links to operate in 5 010-5 030 MHz. Internationally, the 5010-5030 MHz frequency band is under consideration as a potential band for RNSS service links.

Administrations will work with ICAO and the ITU to provide the relevant data and technical expertise to conduct the required compatibility studies between the FCS and non-ICAO standardized systems, as listed in the WRC-07 resolutions, The 5 000-5 030 MHz band is the primary focus of the studies. Administrations will closely monitor the studies regarding the 960-1 164 MHz band. ICAO will undertake any compatibility issues between ICAO standardized systems.

U.S. VIEW: If the spectrum requirements for surface applications at airports cannot be fully accommodated within the 5 091-5 150 MHz band, and if compatibility studies identified in Resolution **420 (WRC-07)** ensure protection of RNSS and RAS from AM(R)S surface applications, the United States supports a new allocation to the AM(R)S in the band 5 000-5 030 MHz.

Furthermore, the United States supports compatibility studies between AM(R)S systems operating in the band 960-1 164 MHz and non-ICAO standardized ARNS systems, and based on the results of studies, will consider if further regulatory measures are required to facilitate introduction of new AM(R)S systems in the band. (August 27, 2008)

UNITED STATES OF AMERICA

PRELIMINARY VIEWS ON WRC-11

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

ISSUE: Under WRC-11 Agenda Item 1.21, administrations will consider a primary radiolocation service allocation in the band 15.4-15.7 GHz. Allocating a primary radiolocation service in the band 15.4-15.7 GHz will provide additional spectrum for new advanced radar systems with increased image resolution and increased range accuracy that require wider emission bandwidths than currently available. Operation of radiolocation radars in this band must not adversely affect other co-primary services in the band or the radio astronomy service in the adjacent band 15.35-15.40 GHz.

BACKGROUND: The band 15.4-15.7 GHz is allocated on a primary basis to the aeronautical radionavigation service (ARNS). There are no ICAO-standard ARNS systems currently operating in this band. While the ARNS is a safety service as delineated in No. 4.10 of the Radio Regulations, radiolocation services have demonstrated compatible operations with radionavigation radars in other frequency bands over many years. The radars achieved compatibility through similar system characteristics such as low-duty cycle emissions and scanning beams, as well as interference reduction techniques. Studies within the ITU-R addressing compatibility between radiolocation and radionavigation radars in other frequency bands provide evidence that sharing in the band 15.4-15.7 GHz between these types of systems may be feasible. Recommendation ITU-R M.1730 contains the technical characteristics and protection criteria for radiolocation radars in the band 15.7-17.3 GHz. Recommendation ITU-R M.1372 identifies interference mitigation techniques that ensure compatibility among radar systems operating in different radiodetermination services. Additionally, ITU-R Report M.2076 contains further mitigation techniques for interference from radiolocation radars into radionavigation radars operating in the 9 GHz band. These techniques may apply to the band 15.4-15.7 GHz. Potential wideband radiolocation radars operating across the entire 15.4-17.3 GHz band must ensure compatibility with systems in the existing 15.7-17.3 GHz radiolocation band. A portion of the 15.4-15.7 GHz band is allocated to the fixed-satellite service (FSS), limited to feeder links for non-geostationary orbit (NGSO) mobile-satellite service (MSS) in both space-Earth and Earth-space directions. Currently, there are no FSS systems operating in the 15.4-15.7 GHz band.

In some administrations, there is limited use of the 15.4-15.7 GHz band for non-ICAO aircraft landing systems. One administration is considering expansion of an existing airport surface detection system, currently operating in the 15.7-16.2 GHz band, to operate in the 15.4-15.7 GHz band.

U.S. VIEW: If the studies identified in Resolution **614 (WRC-07)** demonstrate that the incumbent services and systems can be protected from the potential use of the 15.4-15.7 GHz band by radiolocation systems, the United States supports a new primary allocation to the radiolocation service in the band 15.4-15.7 GHz. (August 27, 2008)