

CGMS XXXIII NOAA-WP-07
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Preparation for World Radiocommunication Conference 2007

This paper presents a summary of agenda items for the International Telecommunication Union's 2007 World Radiocommunication Conference concerning metsat radio frequencies. Also included are the CGMS objective as well as the current status of studies associated with each agenda item.

CGMS Members are encouraged to support protection of the metsat frequencies addressed by these agenda items via contributions to and participation in ITU-R Working Parties through the appropriate radio frequency management representatives within their administrations.

World Radiocommunication Conference 2007 Objectives

Introduction

These are proposed objectives for consideration by CGMS members relative to metsats on the agenda of the 2007 World Radio Communication Conference (WRC-07). The contents may be used by CGMS members to inform their Administrations, and to facilitate conference preparation and WRC consideration.

The presentation is organized to align with Agenda for the WRC-07 as presented in Resolution 802 (WRC-03). Not all of the items in this agenda are of interest to the CGMS and therefore only those specific agenda items, relating to metsat issues, are discussed herein.

The CGMS should support the use of space-based passive sensors to provide vital ecological and environmental data that is unobtainable by any other means. Such passive sensors depend for their successful operation on frequency bands that are defined by the physical laws of the atmosphere.

The CGMS should also support spectrum efficiency and recognize the need for and the value of sharing frequency bands between more than one radio service, in cases where mutually agreed sharing and protection criteria have been established based on the results of International Telecommunication Union-Radiocommunication (ITU-R) studies.

However, in frequency bands allocated to the Earth exploration-satellite (passive) service, where sharing with active systems has been shown to be not feasible, the CGMS must support the view that such active systems should not be implemented, and support any review by administrations that might lead to a reduction in the number of such infeasible sharing situations in the Table of Frequency Allocations.

Agenda Item 1.2 “to consider allocations and regulatory issues related to the Earth exploration-satellite (passive) service, space research (passive) service and the meteorological satellite service in accordance with Resolutions 746 (WRC-03) and 742 (WRC-03)”

Resolution 746 (WRC-03) resolves 1 calls for sharing analyses between geostationary meteorological satellites operating in the space-to-Earth direction and the fixed, fixed-satellite and mobile services in the band 18-18.4 GHz to define appropriate sharing criteria with a view to extending the current 18.1-18.3 GHz geostationary meteorological satellites allocation in the space-to-Earth direction to 300 MHz of contiguous spectrum. This will satisfy the requirement for the transmission of data from high resolution sensors on the next generation geostationary meteorological satellites, which will be launched in the time-frame 2015-2020.

CGMS Objective

CGMS support this expansion of the current 18 GHz allocation for transmission of high rate data from geostationary meteorological satellites. CGMS members are encouraged to support these studies and their discussions via contributions to and participation in ITU-R Working Party 7B through the appropriate radio frequency management representatives within their administration.

Status

Working Parties 4A, 8A, 9D and 7B have nominated points of contact to identify appropriate technical and operational parameters to be taken into account in the studies and to propose working methods that are agreeable to all participating Working Parties prior to the October 2004 meeting of Working Party 7B. Working Party 9D has further noted the existence of the power flux-density limits in RR Table 21-4 that need to be met by the MetSat downlink allocation. Working Party 4A has also provided a clear description of the current and planned use by the FSS in the 18.0-18.1 GHz and 18.3-18.4 GHz bands. Working Party 7B also provided the background information with regard to system parameters and link budget examples for next generation geostationary meteorological satellite systems as well as the corresponding performance, interference and sharing criteria to Working Parties 4A, 8A and 9D. Working Party 4A has continued the dialog with Working Party 7B via exchange of several liaison statements sent in June 2005 concerning draft Conference Preparatory Meeting text, compatibility studies between metsats and fixed satellites, and an update to the fixed satellite database. These inputs will be considered at the November 2005 meeting of Working Party 7B.

Resolution 746 (WRC-03) resolves 2 calls for sharing analyses between the EESS (passive) and the SRS (passive) and the fixed and mobile services in the band 10.6-10.68 GHz to determine appropriate sharing criteria. The EESS (passive) operating in the band 10.6-10.68 GHz may experience harmful interference from the emissions of systems of active services. The band 10.6-10.68 GHz is of primary interest for the measurement of rain, snow, sea state, ocean wind and soil moisture.

CGMS Objective

CGMS support the protection of the passive services from the active services in the 10.6-10.68 GHz band. CGMS members are encouraged to support these studies and their discussions within CGMS and via contributions to and participation in ITU-R Working Party 7C through the appropriate radio frequency management representatives within their administration.

Status

Dynamic models and Monte Carlo simulations have been used within Working Party 7C for initial studies of the protection of passive sensors from fixed and mobile terrestrial systems. These studies are being refined within Working Party 7C as additional information is made available. Technical and operational characteristics of systems in the fixed service to facilitate sharing with passive services in the 10.6-10.68 GHz band without undue constraints on the fixed service were tentatively

updated in a draft revision to Recommendation F1336 but need to be finalized by Working Party 9D. The next meeting of Working Party 7C is November 2005.

Resolution 742 (WRC-03) calls for sharing studies between the passive services and the fixed and mobile services in the band 36-37 GHz in order to define appropriate sharing criteria. EESS (passive) systems may experience harmful interference if a high density of fixed or mobile service stations is deployed in the band 36-37 GHz.

CGMS Objective

CGMS support the protection of EESS (passive) systems and encourage its members to consider carefully any deployment of fixed or mobile service stations in the 36-37 GHz band within their Administrations. CGMS members are encouraged to support sharing studies and their discussions within CGMS and via contributions to and participation in ITU-R Working Party 7C through the appropriate radio frequency management representatives within their administration.

Status

Dynamic models and Monte Carlo simulations have been used within Working Party 7C for initial studies of the protection of passive sensors from terrestrial fixed and mobile systems in the 36-37 GHz band; these studies continue to be refined within Working Party 7C. Working Party 9D is developing the characteristics of fixed service systems in this band. Working Party 8A provided information on mobile stations operating in the 36-37 GHz band after their May 2005 meeting that are now being used to further refine the studies ongoing in Working Party 7C. The next meeting of Working Party 7C is November 2005.

Agenda Item 1.4 “to consider frequency-related matters for the future development of IMT (International Mobile Telecommunications) -2000 and systems beyond IMT-2000 taking into account of the results of ITU-R studies in accordance with Resolution 228 (Rev.WRC-03)”

Any allocation to the IMT-2000 systems in bands already allocated to the meteorological aids, meteorological-satellite, Earth exploration-satellite, and space research services could pose a threat to those services.

CGMS Objective

The CGMS objective is to protect space science services allocations that may be considered for allocation to IMT-2000 and future systems, and support suppression of Resolution 228 (Rev. WRC-03). It is recommended that CGMS members participate in and contribute to the preparation of CPM text, through the appropriate radio frequency management representatives within their administrations, to ensure that the bands of interest to CGMS members, in particular the 2025 - 2110 MHz, 2200 – 2290 MHz bands and the 2290 – 2300 MHz bands, are not considered suitable and available to satisfy the requirements of IMT-2000 and systems beyond

IMT-2000. And, in addition, that the provisions regarding the use of the 2110 – 2120 MHz band are not further eroded to accommodate the future requirements of IMT-2000 and systems beyond IMT-2000. CGMS members are also encouraged, via the appropriate radio frequency management representatives within their administration, to review the results of these studies as documented by ITU-R Working Party 8F and to offer comments to Working Party 8F through Study Group 7.

Status

Working Party 8F is developing a number of studies and a Recommendation that are to be completed by March 2006. Working Party 8F is developing a survey to collect comments from interested parties on a variety of issues relating to services and markets to be provided by and/or envisaged for the future development of IMT-2000 and systems beyond IMT-2000. Results of this survey will be used to support the development of CPM text for WRC 2007.

Agenda Item 1.5 “to consider spectrum requirements and possible additional spectrum allocations for aeronautical telecommand and high bit-rate aeronautical telemetry, in accordance with Resolution 230 (WRC-03)”

Resolution 230 (WRC-03) calls for additional allocations between 3 and 30 GHz for wideband aeronautical telemetry and associated telecommand. The impacts to existing allocations to meteorological aids, meteorological-satellite, Earth exploration-satellite, and space research need to be considered as new allocations to wideband aeronautical telemetry and associated telecommand are pursued.

CGMS Objective

The CGMS objective is to protect existing space science services allocations and to support the studies that may lead to additional allocations in the 3 to 30 GHz band for aeronautical telecommand and high bit-rate aeronautical telemetry, which may also be used during atmospheric testing by space agencies. CGMS members are encouraged to support these studies and their discussions within CGMS and via contributions to and participation in ITU-R Working Party 8B through the appropriate radio frequency management representatives within their administration.

Status

Working Party 8B developed a framework for draft CPM text at its December 2003 meeting. Working Party 8B has identified the need for requirements, candidate spectrum, and sharing studies to further work on this agenda item. The next meeting of Working Party 8B is September 2005.

Agenda Item 1.6 “to consider additional allocations for the aeronautical mobile (R) service in parts of the bands between 108 MHz and 6 GHz, in accordance with Resolution 414 (WRC-03) and, to study current satellite frequency allocations that

will support the modernization of civil aviation telecommunication systems, taking into account Resolution 415 (WRC-03)”

Resolution 414 (WRC-03) calls for a review of bands allocated to aeronautical systems in the frequency range between 108 MHz and 6 GHz, and to determine whether additional allocations to the aeronautical mobile (R) service are required.

Existing allocations to meteorological-satellites and Earth exploration-satellites need to be taken into account during the studies of possible new allocations to the aeronautical mobile service.

CGMS Objective

The CGMS objective is to protect existing space science services allocations in the 108 MHz and 6 GHz bands. CGMS members are encouraged to review studies within CGMS and contribute to and participate in ITU-R Working Party 8B through the appropriate radio frequency management representatives within their administration.

Status

Working Party 8B did not receive contributions on this agenda item at its December 2003 meeting. Areas to be addressed by Working Party 8B per its work plan include requirements, additional spectrum needed to fulfill these requirements, candidate bands for study, and the studies themselves. The next meeting of Working Party 8B is September 2005.

Agenda Item 1.8 “to consider the results of ITU-R studies on technical sharing and regulatory provisions for the application of high altitude platform stations operating in the bands 27.5-28.35 GHz and 31-31.3 GHz in response to Resolution 145 (WRC-03), and for high altitude platform stations operating in the bands 47.2-47.5 GHz and 47.9-48.2 GHz in response to Resolution 122 (Rev.WRC-03)”

Resolution 145 (WRC-2003) calls for technical sharing criteria for high altitude platform stations (HAPS) system design conditions to ensure that HAPS applications in the fixed service operate successfully on a non-harmful interference, non-protected basis in the bands 27.5-28.35 GHz and 31-31.3 GHz. The 31.3-31.8 GHz band is allocated to the radio astronomy, Earth exploration-satellite (passive) and space research (passive) services. WRC-03 amended No. 5.543A to specify signal levels that would protect satellite passive services and radio astronomy stations in the band 31.3-31.8 GHz.

HAPS unwanted emission limits as given in footnote 5.543A may have to be revised in light of modifications to Recommendation ITU-R SA.1290 (see also Agenda Item 1.20).

CGMS Objective

CGMS support the need for protection of the 31.3-31.8 allocation to the radio astronomy, Earth exploration-satellite (passive) and space research (passive) services. CGMS members will review the results of the HAPS studies as documented by Working Party 4-9S, and participate in Working Parties 7C, 7D and 4-9S as necessary, through the appropriate radio frequency management representatives within their administration, to ensure that the passive space science services are protected.

Status

Working Party 4-9S initiated work on this agenda item at its February 2004 meeting but focused on the 27.5-28.35 GHz band. The next meeting of Working Party 4-9S is scheduled for November 2005.

Agenda item 1.18 “to review pfd limits in the band 17.7-19.7 GHz for satellite systems using highly inclined orbits, in accordance with Resolution 141 (WRC-03)”

Resolution 141 (WRC-03) calls for studies to determine whether the current pfd limits for non-GSO systems in the FSS in Article 21 are adequate to protect the fixed service in the 17.7-19.7 GHz band from non-geostationary systems without unduly constraining the use of these non-GSO FSS systems, and to determine whether there are technical and operational measures in the band 17.7-19.7 GHz that could be implemented in the fixed service to mitigate interference from FSS space stations. The band 18.1-18.3 GHz is allocated to the meteorological-satellite service (space-to-Earth) on a primary basis, limited to geostationary satellites and in accordance with the provisions of Article 21, Table 21-4, under footnote 5.519. The band 18.6-18.8 MHz is allocated to EESS (passive).

CGMS Objective

CGMS support the protection of these existing science service allocations. CGMS members are encouraged to monitor these non-GSO FSS system studies and their discussions within CGMS and via contributions to and participation in ITU-R Working Parties 7C and 4-9S through the appropriate radio frequency management representatives within their administration.

Status

During the February 2004 meeting of Working Party 4-9S, the need for additional information was identified and liaison statements were sent to Working Parties within Study Groups 3, 4 and 9. The next meeting of Working Party 4-9S is scheduled for November 2005.

Agenda item 1.20 “to consider the results of studies, and proposals for regulatory measures regarding the protection of the Earth exploration-satellite service (passive) from unwanted emissions of active services in accordance with Resolution 738 (WRC-03)”

Resolution 738 (WRC-03) calls for studies on the compatibility analyses between EESS (passive) and the corresponding active services in certain bands listed below with a view to updating Recommendation ITU-R SM.1633 or developing additional Recommendations.

EESS (passive) band	Active service band	Active service
1 400-1 427 MHz	1 350-1 400 MHz	Fixed service (FS) Mobile service (MS) Radiolocation service
1 400-1 427 MHz	1 427-1 429 MHz	FS, MS (except aeronautical mobile service) and space research service* (Earth-to-space)
1 400-1 427 MHz	1 429-1 452 MHz	FS and MS
23.6-24 GHz	22.55-23.55 GHz	Inter-satellite service
31.3-31.5 GHz	30-31 GHz	FSS (Earth-to-space)
50.2-50.4 GHz ¹	50.4-51.4 GHz ¹	FSS (Earth-to-space) ¹
50.2-50.4 GHz ¹	47.2-50.2 GHz (Regions 2 and 3) 49.44-50.2 GHz ¹ (Region 1)	FSS ¹

¹ Studies in this band must take into account No. **5.340.1** of the Radio Regulations.

* An apparent anomaly is present in the text of Resolution 738 (WRC-03) with respect to the active services in the band 1 427-1 429 MHz. According to the Table in the Resolution, the fixed, mobile (except aeronautical mobile) and space research (Earth-to-space) services are to be considered in this band. In fact, the band 1 427-1 429 MHz is allocated to the fixed, mobile (except aeronautical mobile) and space operation (Earth-to-space) services.

Resolves 2 of Resolution 738 (WRC-03) invites the ITU-R to further study the impact of implementing the values provided in *considering f*) and *g*) for unwanted emissions of fixed-service systems operating in Regions 2 and 3, taking into account that the impact on fixed-service systems in Region 1 has already been investigated.

According to Recommendation ITU-R SM.1633, the EESS (passive) in the band 31.3-31.5 GHz can be protected if the unwanted emissions of fixed-service systems (except high-altitude platform stations) operating in the band 31.0-31.3 GHz do not exceed –38 dBW in a 100 MHz reference bandwidth in the band 31.3-31.5 GHz (*considering f*).

According to Recommendation ITU-R SM.1633, the EESS (passive) in the band 52.6-54.25 GHz can be protected if the unwanted emissions of fixed-service systems operating in the band 51.4-52.6 GHz do not exceed –33 dBW in a 100 MHz reference bandwidth in the band 52.6-54.25 GHz (*considering g*). The results of Rec. ITU-R SM.1633 were based on the use of values obtained from Rec. ITU-R SA.1029-1 which have been superceded by Rec. ITU-R SA.1029-2. This will require that the Recommendation ITU-R SM.1633 annexes pertaining to EESS will need to be revised and the corresponding results re-examined.

CGMS Objective

CGMS support the protection of these EESS (passive) allocations that are of vital interest to the future of satellite-based retrievals for significantly enhancing weather prediction and climate models on a global scale. CGMS members are encouraged to participate in these studies and their discussions within CGMS and via contributions to and participation in ITU-R Working Party 7C and Task Group 1/9, through the appropriate radio frequency management representatives within their administration, with the aim of developing appropriate (regulatory) measures to ensure the protection of the Earth exploration satellite service (passive) from unwanted emissions. Similarly, CGMS members are encouraged, through the appropriate radio frequency management representatives within their administration, to consider contributions to Working Party 7C in bands other than those listed in Resolution 738 (WRC-03) for possible development of joint ITU-R Recommendations with the affected active services.

Status

Task Group 1/9 met in April 2004 and February 2005 and has developed a number of Working Documents addressing updates the annexes of Recommendation ITU-R SM.1633. Draft CPM text for this agenda item was developed. The next meeting of Task Group 1/9 is scheduled for September 2005.

Items of interest to CGMS members for consideration at a future conference

The items of interest to CGMS members for consideration at a future conference are listed here. The presentation is organized to align with Agenda for the WRC-10 as presented in Resolution 803 (WRC-03). Not all of the items in that agenda are of interest to the CGMS and therefore only those specific agenda items, relating to CGMS issues, are presented herein.

Agenda item 2.2 “to consider frequency allocations between 275 GHz and 3 000 GHz taking into account the result of ITU-R studies in accordance with Resolution 950 (WRC-03)”

Agenda item 2.7 “to consider the progress of ITU-R studies concerning the technical and regulatory issues relative to the fixed service in the 81-86 and 92-100 GHz frequency bands, taking into account Resolutions 731 (WRC-2000) and 732 (WRC-2000)”

Agenda item 2.8 “to consider the progress of the ITU-R studies concerning the development and regulatory requirements of terrestrial wireless interactive multimedia applications, in accordance with Recommendation 951 (WRC-03) and to take any appropriate action on this subject”

Other items of interest to CGMS which are not currently proposed for any WRC agenda include:

- To review footnote 5.332 and 5.335A of the Radio Regulations (RR) with respect of the frequency band 1 215-1 260 MHz and 1260-1300 MHz concerning the Earth exploration-satellite (active) service and other services
- To highlight the importance and restrictions imposed on the 1544-1545 MHz band under RR footnote 5.356 for safety and distress communications by modifying the Table of Frequency Allocations of the ITU Radio Regulations.
- Review the need for RR footnotes 5.536A and 5.536B appended to the allocations to the space science services in the 25.25-27.5 GHz band.