CGMS

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GENERAL FREQUENCY MANAGEMENT TOPICS

This document reports on additional spectrum requirements for next generation EUMETSAT systems, geostationary (MTG) and polar-orbiting (Post-EPS), in particular for the downlink of the significantly increased raw instrument data rates to the primary ground stations.

It also identifies the need for appropriate regulatory provisions and the protection of passive sensing in particular bands between 1 and 60 GHz as well as in bands above 275 GHz.

GENERAL FREQUENCY MANAGEMENT TOPICS

1 INTRODUCTION

For next generation EUMETSAT systems, geostationary (MTG) and polar-orbiting (Post-EPS), additional spectrum requirements have been identified in particular for the downlink of the significantly increased raw instrument data rates to the primary ground stations.

Furthermore, future potential instruments in the framework of Post-EPS might utilise frequency bands above 275 GHz that today do not have any regulatory recognition.

In addition current and even more future instruments in the framework of EPS and Post-EPS utilise frequency bands for passive sensing for which protection will need to be ensured through the establishment of appropriate regulatory provisions in the Radio Regulations at the forthcoming World Radiocommunications Conference in 2007 (WRC-07).

Following, the status of those frequency spectrum issues in relation to future EUMETSAT systems are described.

2 FREQUENCY SPECTRUM ISSUES IN RELATION TO FUTURE EUMETSAT SYSTEMS

2.1 WRC-07 Agenda Item 1.2 (extension of the 18-GHz MetSat downlink frequency allocation)

With regard to the issue of extending the current 18.1-18.3 GHz geostationary meteorological satellites (MetSat) allocation in the space-to-Earth direction to 300 MHz of contiguous spectrum, all compatibility studies with the other allocated radiocommunication services in the targeted extension bands above and below the already allocated band have been performed by EUMETSAT and fed into the responsible ITU-R Working Party 7B.

According to the results of studies that are generally supported within ITU, sharing between MetSat and the other services is equally possible in either direction although the regulatory framework is slightly different in the two bands because of the priority status for feeder links in the Broadcasting-Satellite Service in the band 18.0 – 18.1 GHz.

Having due regard to the potential limitations due to coexistence with BSS plan feeder links in the 18.0 - 18.1 GHz band that are subject to Appendix 30A of the Radio Regulations, EUMETSAT favours the extension into the band 18.3 – 18.4 GHz.

The European Conference of Postal and Telecommunications Administrations (CEPT) supports the views of EUMETSAT for such an extension of the MetSat allocation by 100 MHz upwards as the prime option. However, in case an extension of the MetSat allocation in the band 18.3 – 18.4 GHz should not be possible on a world-wide basis and thus the inter-operability of MetSat systems between ITU-R Regions should be hindered, an extension into the band 18.0 – 18.1 GHz would be the alternative option for CEPT.

In general it can be concluded that there is broad support worldwide for an extension of the 18-GHz MetSat allocation by 100 MHz, given the positive conclusion with regard to the possibility of sharing with the already allocated services. The only question that remains open is the direction to which the MetSat allocation should be extended.

However, with regard to the direction of the extension of the 18-GHz MetSat allocation so far a clear preference has only been expressed by Europe (upwards), the Arab League (upwards), USA and Canada (both downwards). In view of possible inter-operability of MetSat systems in the long term future a common extension band throughout the ITU-R Regions might be beneficial.

In light of the above, CGMS members are invited to express their views on the direction in which the MetSat allocation should preferably be extended.

2.2 Preliminary Agenda Item 2.2 for WRC-2010 regarding frequency allocations for the Earth Exploration Satellite Service (passive) for band above 275 GHz

Currently, frequency bands above 275 GHz are not allocated in the frequency allocation table of the ITU Radio Regulations (RR). Only RR footnote 5.565 governs the use of a list of frequency bands in the range 275-1 000 GHz by passive and active services and recognises the need to conduct further experimentation and research.

A preliminary agenda item for WRC-2010 as agreed at WRC-03 (Resolution 803) asks for consideration of the frequency allocations between 275 GHz and 3 000 GHz taking into account the results of ITU-R studies in accordance with Resolution 950 (WRC-03).

However, to retain this issue at the forthcoming WRC-07 on the agenda for WRC-2010, the interest for such an agenda item will have to be promoted and fed into the relevant WRC-07 preparation processes. Within the CEPT preparation for WRC-07 the interest of the science community on the topic was already briefly introduced.

EUMETSAT is currently in the process of determining the mission requirements (Phase 0) for the EUMETSAT Polar System (EPS) follow-on system (Post-EPS) in terms of potential observations, instruments and user-service missions which also include observations in frequency bands above 275 GHz. The need date for Post-EPS is 2019.

In the process of determining the user needs and priorities a number of candidate missions and the relevant preliminary requirements were identified. Among those candidate missions a Microwave Imager (MWI) was identified as an important mission to be implemented on Post-EPS. This MWI will potentially utilise frequency bands above 275 GHz including a number of bands which are not yet contained in RR footnote 5.565, thus having no regulatory recognition and protection.

Therefore, EUMETSAT plans to introduce a proposal in the European preparatory process for WRC-07 for an agenda item for WRC-2010 asking for a revision of RR footnote 5.565 to update the uses of the spectrum from 275 to 3 000 GHz by the Earth exploration-satellite (passive), radio astronomy, and space research (passive) services.

CGMS members are invited to promote such an agenda item for WRC-2010 also within their regional preparatory processes for WRC-07 in order to pave the way for future sensor applications using bands above 275 GHz on the basis of appropriate regulatory provisions and protection.

2.3 Potential additional frequency spectrum requirement for raw data downlink of Post-EPS

The spectrum available and nominally foreseen for the downlink of raw instrument data of polar-orbiting MetSat systems, namely 7750 – 7850 MHz, already today is very limited and forced most operators of the soon to be launched systems to use other frequency bands (see Table 7 of the Report of CGMS-33) that like the band 8025 – 8400 MHz are already facing congestion. Increasing spectrum requirements of next generation polar-orbiting systems like the EUMETSAT Polar System (EPS) follow-on system (Post-EPS) will worsen this situation.

In order to be able to provide continuation of the current EPS services in an enhanced manner and to fulfil the additional missions requested in the framework of Post-EPS, the amount of raw instrument data will increase significantly, exceeding the bandwidth that is currently available in the band 7750 – 7850 MHz.

Due to this further increasing spectrum requirement of future polar-orbiting MetSat systems like Post-EPS it might be worthwhile to consider promoting the extension of the frequency allocation to the MetSat service in the frequency band 7750 – 7850 MHz and in such a way to keep the band usable for the MetSat service in a longer term perspective.

CGMS members are invited to take note of this potential frequency spectrum requirement for Post-EPS and the potential need for an extension of the MetSat frequency allocation in the band 7750 – 7850 MHz.

2.4 Appropriate protection of frequency bands for passive sensors in the ITU Radio Regulations

WRC-07 Agenda Item 1.2 asks for the definition of appropriate sharing criteria between the passive and the active (transmitting) services in the bands 10.6 – 10.68 GHz and 36 – 37 GHz.

According to WRC-07 Agenda Item 1.20 appropriate regulatory measures have to be developed to ensure the protection of the Earth exploration satellite service (passive) in the bands 1400 - 1427 MHz, 23.6 - 24 GHz, 31.3 - 31.5 GHz, 50.2 - 50.4 GHz from unwanted emissions of active services in neighbouring frequency bands.

All of the above mentioned frequency bands (some of which are already used by the AMSU instrument on MetOp) are potential frequencies to be used by candidate instruments/missions in the framework of Post-EPS. The establishment of appropriate regulatory provisions in the RR are therefore very important which ensure the protection of the use of those bands by passive sensors.

Currently, the required level of protection for passive sensors and the resulting restrictions for the active services are still far from the levels acceptable for the proponents of the active services for many of the aforementioned frequency bands.

CGMS members are invited to support the establishment of appropriate regulatory provisions in the RR at WRC-07 that would ensure the protection of passive sensing in the long term.