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EUMETSAT REPORT ON FREQUENCY MANAGEMENT TOPICS

The agenda of the World Radiocommunication Conference 2012 (WRC-12) contains a number of issues of interest and concern to the meteorological satellite (MetSat) operators.

This Working Paper provides an overview of the status of the preparation, on EUMETSAT side, for WRC-12 for the most important issues related to the MetSat service and the Earth Exploration Satellite Service (EESS), namely the allocation of additional spectrum for MetSat in the frequency band 7850 – 7900 MHz under WRC-12 agenda item 1.24 and the review the bands above 275 GHz for use by EESS passive sensors under agenda item 1.6.

Also WRC-12 agenda item 1.25 is highlighted as recently became an issue of concern to MetSat operators, due to the identification of the band 7750 – 7900 MHz to be studied for a possible future allocation to the Mobile Satellite Service (MSS), as this has the potential to negatively impact the future use of this frequency band by MetSat systems.

EUMETSAT REPORT ON FREQUENCY MANAGEMENT TOPICS

1 INTRODUCTION

This working paper provides an overview of agenda items of the World Radiocommunication Conference 2012 (WRC-12) on issues of most interest to EUMETSAT related to the Meteorological Satellite Service (MetSat) and the Earth Exploration Satellite Service (EESS).

Also a WRC-12 agenda item is highlighted that recently became an issue of concern to MetSat operators as it has the potential to negatively impact the future use of a frequency band allocated to the MetSat service.

2 WRC-12 agenda items of interest

WRC-12 contains agenda item 1.24 which considers the allocation of additional spectrum for MetSat in the frequency band 7850 – 7900 MHz and agenda item 1.6 calling for a review of the bands above 275 GHz for use by EESS passive sensors.

Preparation of these agenda items of direct interest to MetSat operators in the relevant ITU-R fora already progressed well to a level at which one could expect a positive outcome at WRC-12.

2.1 WRC-12 Agenda Item 1.6 regarding frequency allocations for EESS (passive) in bands above 275 GHz

WRC-12 Agenda Item 1.6 calls for review of footnote 5.565 of the Radio Regulations in which currently a number of frequency bands are listed that can be used for passive sensing. The aim of this agenda item is to update the list of frequency bands for spectrum use by the passive services between 275 GHz and 3 000 GHz in order to better reflect the current and future planned use of passive sensors. Investigations are on-going within ITU-R and SFCG to identify the most up-to-date and relevant frequency bands for passive sensing.

EUMETSAT supports the process within ITU-R and SFCG for revision of RR No. 5.565 to include all appropriate frequency bands within the range 275 to 3000 GHz to be used by systems belonging to the Earth exploration-satellite (passive) in order to protect these bands for scientific applications now and in the future.

Frequency bands above 275 GHz currently planned to be used by the Microwave Imager (MWI) instrument in the framework of Post-EPS were fed into the relevant fora and are properly reflected in the relevant documentation within SFCG (SFCG-Resolution 29-1 "Passive bands of interest above 275 GHz") and the ITU-R ("Draft New Report ITU-R RS.[above 275] on Passive bands of interest to EESS/SRS from 275 to 3000 GHz").

2.2 WRC-12 Agenda Item 1.24 (Extension of the MetSat allocation at 7750–7850 MHz by 50 MHz into the band 7850 – 7900 MHz)

WRC-12 Agenda Item 1.24 calls for consideration of extension of the existing allocation to the MetSat service in the band 7750 - 7850 MHz by 50 MHz to cover also the band 7850 - 7900 MHz, limited to non-geostationary meteorological satellites in the space-to-Earth direction.

The mission requirements for next generation non-GSO meteorological satellites in terms of observations, instruments and user-services clearly show a need to transmit higher data rates compared to current systems.

EUMETSAT supports the extension of the existing allocation of the 7750-7850 MHz band to the MetSat service (space-to-Earth) for use by non-geostationary satellites into the 7850-7900 MHz band and performed and introduced the necessary sharing studies in the relevant ITU-R Working Party 7B resulting in “DRAFT NEW REPORT ITU-R [METSAT 7.9 GHz] on Compatibility between the meteorological satellite and the fixed service in the band 7 850-7 900 MHz”.

From the results of the sharing studies which is taking into account use of the band by MetSat for raw data dump and/or direct readout applications it can be concluded that the sharing scenarios in the frequency band 7850-7900 MHz are similar to ones in the frequency band 7750-7850 MHz, thus MetSat could be operated under the same regulatory conditions like in the existing MetSat band.

Considering the different concepts for using this band by current polar-orbiting MetSat systems, such as FY-3, NPOESS and Metop and the potential to interfere with each other, once the band 7850 – 7900 MHz is allocated to MetSat (at WRC-12) a coordinated approach for planning the long term use of the entire band 7750 – 7900 MHz would be necessary, taking into account SFCG RES 19-7R3.

3 WRC-12 Agenda Items with potential negative impact on MetSat and EESS (passive)

Since a number of WRC-12 Agenda Items are very wide in scope, searching for suitable frequencies for different applications in a large spectrum range without specifying which frequency band is targeted; all those WRC-12 agenda items are monitored carefully until the candidate bands are identified.

Currently, the issue with the highest potential impact on MetSat systems is WRC-12 Agenda Item 1.25 which calls for consideration of possible additional allocations to the MSS in bands between 4 GHz and 16 GHz.

3.1 WRC-12 Agenda Item 1.25 (Additional allocations to the Mobile-Satellite Service (MSS) between 4 GHz and 16 GHz)

Within the framework of the ITU-R the band 7750 – 7900 MHz is currently listed as one of the candidate bands to be studied for a future MSS allocation (Earth-to-space direction) under WRC-12 agenda item 1.25 as proposed by the MSS proponents, for which sharing studies with the existing services will need to be performed.

Regarding the sharing studies still to be performed within the framework of the ITU-R for a potential MSS uplink (Earth-to space) in a band allocated to a MetSat downlink (7750 - 7850 (7900)MHz), the risk of interference by the MSS uplink through the sidelobes of the Metsat Earth stations needs to be assessed.

For MSS feeder links the required coordination distance around the Metsat Earth station, taking into account the protection levels identified in the relevant ITU-R SA series Recommendations and the fact that those stations can operate down to 5 degrees elevation would have to be assessed.

For Mobile Earth Stations (MES) of the MSS, as well the required coordination distance around the Metsat Earth station would have to be assessed on the basis of the maximum EIRP from the MES.

Separation distances in the order of 20 – 100 km between MSS feeder links or MES uplink stations and MetSat Earth stations can be expected. In particular with MES, the mobile nature of such devices doesn't allow for any form of coordination with MetSat Earth stations and only the area directly under the control of the MetSat station operator can be guaranteed to be free of potential MES interferers.

Thus, if adopted at WRC-12, an allocation to the MSS (uplink) in the band 7750 - 7900 MHz could constrain the future use of the band by MetSat, in particular for direct-readout stations.

To counter a potential allocation to the MSS, MetSat operators will have to study and determine the required separation distance to MetSat Earth stations and to feed in the results and raise their concerns in the relevant ITU-R and regional preparatory fora for WRC-12.

The aim should be to get the band 7750 – 7900 MHz deleted from the list of bands to be studied for a potential allocation to the MSS in order to avoid a potential impact to the future use of this band by MetSat systems.

4 Coordination of future DCS use in the band 401 – 403 MHz

The status of coordination of the future use of the band 401 – 403 MHz for Data Collection Systems (DCS) by geostationary and non-geostationary meteorological satellite systems is described in detail in document CGMS-37 EUM-WP-21 (Update of the status of the coordinated use of the DCP band).

CGMS is invited to take note and comment the presented status of the Frequency Management activities on EUMETSAT side