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|  | | Doc. CPG15(14)017 Annex IV-10 |
| CPG15-4 | |  |
| Riga, Latvia 25th - 28th March 2014 | |  |
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| Date issued: | 28th March 2014 | |
| Source: | CPG15-4 | |
| Subject: | Draft CEPT Brief on WRC-15 Agenda Item 1.9.2 | |
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| Summary: | | |
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| Proposal: | | |
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DRAFT CEPT BRIEF ON AGENDA ITEM 1.9.2

1.9 to consider, in accordance with Resolution 758 (WRC‑12):

(…)

1.9.2 the possibility of allocating the bands 7 375-7 750 MHz and 8 025-8 400 MHz to the maritime-mobile satellite service and additional regulatory measures, depending on the results of appropriate studies;

# ISSUE

“to conduct technical and regulatory studies on the possibility of allocating the bands 7 375-7 750 MHz (space-to-Earth) and 8 025-8 400 MHz (Earth-to-space), or parts thereof, to the maritime-mobile satellite service, while ensuring compatibility with existing services”

# Preliminary CEPT position

CEPT supports the results of the ITU-R studies on the possibility of making a new allocation to the MMSS in the bands 7 375-7 750 MHz (space-to-Earth) and 8 025-8 400 MHz (Earth-to-space), subject to not placing undue constraints to and to ensuring protection of the services already allocated in these frequency bands.

To this respect, CEPT does not support the usage of these bands for applications that could imply a deployment of a large number of Earth stations in the MMSS. In particular, CEPT does not support the usage of the bands 7 375-7 750 MHz (space-to-Earth) and 8 025-8 400 MHz (Earth-to-space) for e-navigation or GMDSS.

CEPT notes that the ITU-R and CEPT studies show that compatibility between EESS (space-to-Earth) and MMSS in the band 8025-8400 MHz requires the establishment of large exclusion zones around the EESS earth stations. CEPT also notes that the maintenance of an exclusion zones database and the enforcement of these exclusion zones for a steadily growing number of EESS Earth stations makes such an allocation impracticable. In addition, CEPT notes that the protection of SRS deep space stations in adjacent band would have to be ensured through a combination of unwanted emission limits and/or exclusions zones, therefore adding to the constraints on MMSS.

Consequently CEPT doesn’t support an allocation for MMSS in the band 8025-8400 MHz without acceptable and practicable regulatory methods.

CEPT is still considering its position on the allocation of the band 7375-7750 MHz to MMSS.

# Background

The frequency bands 7 250-7 375 MHz (space-to-Earth) and 7 900-8 025 MHz (Earth-to-space) are also allocated to the mobile-satellite service on a primary basis, subject to agreement obtained under No 9.21 (see No. 5.461). Regarding the maritime-mobile-satellite service (MMSS), some administrations have reported a shortfall of spectrum available for their current and future applications in these bands.

WRC-15 Agenda Item 1.9 and Resolution 758 (WRC-12) invite ITU-R to conduct technical and regulatory studies on a possible new allocations to the MMSS in the frequency bands 7 375-7 750 MHz (s-E) and 8 025-8 400 MHz (E-s).

CEPT was a proponent of this agenda item, under the understanding that the requirements for additional allocations were for specific applications and a limited number of Earth stations in the MMSS. This assumption shall continue to be the basis of studies and any other potential usage of the band that would imply the potential deployment of a large number of MMSS Earth stations (e.g. e-navigation) should be opposed. Should any allocation be made to MMSS, appropriate regulatory mechanisms should be put in place to this effect.

Working Party 4C has been identified by the Conference Preparatory Meeting as the responsible ITU-R groups for the studies on WRC-15 agenda item 1.9.2. At their first meetings, the group sent liaison statements to gather technical characteristics and protection criteria needed to perform the appropriate sharing studies with existing services. They also established work plans for the band-by-band studies as well as for the development of the draft CPM text. WP4C also start a working document.

### Sharing with FS in the bands 7 375 – 7 750 MHz and 8 025 – 8 400 MHz

### Sharing with MS in the bands 7 375 – 7 750 MHz and 8 025 – 8 400 MHz

### Sharing with FSS in the bands 7 375 – 7 750 MHz and 8 025 – 8 400 MHz

### Sharing with the Meteorological satellite service in the bands 7 450 – 7 550 MHz and 8 175 – 8 215 MHz

### Sharing with the EESS (space-to-Earth) in the band 8 025-8 400 MHz

The band 8 025-8 400 MHz is heavily used by all space agencies, but also government or private companies to download data obtained by EESS satellites. Future EESS missions will continue to use this band. The Space Frequency Coordination Group (SFCG) maintains a database on a best effort basis to provide an overview of all EESS missions operating in the 8025-8400 MHz range which includes 100 operational missions, plus up to 50 missions in development phase. Globally, there are many earth station sites located close to the sea that may be employed for tracking EESS satellites, with each site possibly having multiple stations. Most of EESS satellite missions are in non-GSO and even LEO orbits, however the allocation may also be used for GSO EESS missions, as indicated by No.5.462A.

In order to assist WP 4C, Working party 7B has used the agreed upon methodology described in recommendation SA.1277 (which has been brought to the attention of study group 4) to evaluate the separation distances (for MMSS) that would be required in order to protect receiving EESS Earth stations from harmful interference from a single transmitting MMSS Earth stations. This study shows that an allocation to the maritime mobile satellite service in the band 8 025‑8 400 MHz will create a potential for harmful interference to the numerous receiving EESS earth stations located close to the coast worldwide. The separation distances for the sample actual EESS earth stations considered in the study are in the range of 480 km to more than 540 km over water depending upon the geographical characteristics surrounding the EESS earth station. It is to be noted that this analysis is based on the presence in the area of a single MMS terminal operating on a single channel. In case of multiple MMS terminals operating on multiple channels, the required exclusion zone would grow accordingly. It is to be noted also that the number and location of the MMSS Earth stations is dynamically evolving. In addition, RR article 21.8 allows for a much higher EIRP value towards the horizon for FSS Earth stations. Using this EIRP limit would increase the separation distances.

It can therefore be concluded that the sharing between MMSS systems and EESS systems would not be practicable due to the high and dynamically variable number of large exclusion zones at sea needed to protect the EESS Earth stations.

### Compatibility with SRS (Deep space) in the band 8 400 – 8 450 MHz

The same methodology was applied by WP 7B to derive separation distance between MMSS and SRS (deep space) Earth stations operating in the adjacent band 8 400 – 8 450 MHz. In the absence of information related to the performance of MMSS unwanted emissions suppression, and since the criteria have to be met in the first Hz of the SRS (deep space) allocation, no unwanted emission attenuation has been considered. Under these assumptions, the separation distances required to protect the ESA network from one active MMSS station ranges about 120 km to 517 km at New Norcia (Australia) when the terrain is duly accounted for. It is to be noted that this analysis is based on the presence in the area of a single MMS terminal operating on a single channel. In case of multiple MMS terminals operating on multiple channels, the required exclusion zone would grow accordingly.

In addition, RR article 21.8 allows for a much higher EIRP value towards the horizon for FSS Earth stations. Using this EIRP limit would increase the separation distances. However, if the e.i.r.p. spectral density towards the horizon at 8 400 MHz band-edge can be sufficiently reduced, then the required separation distances would also be reduced.

# List of relevant documents

4C/173 Annex 12- Working document - Draft CPM text for WRC-15 Agenda item 1.9.2

4C/173 Annex 13- Working document - Work plan for WRC-15 Agenda item 1.9.2

4C/173 Annex 07- Working document towards a preliminary draft new Report ITU-R M.[MMSS 7/8 GHz SHARING] - Possible allocations to the maritime mobile-satellite service in the 7/8 GHz range

7B/154 Annex 15- Working document towards a preliminary draft new Report ITU-R SA.[MMSS 8-GHz] - Compatibility of the possible new MMSS (E-s) allocation in the 8 025-8 400 MHz band with EESS and SRS

# Actions to be taken

In order to facilitate the technical studies and in support of ITU-R studies, WP 4C sent liaison statements to WP4A, 5A, 5B, 5C, and 7B in order to obtain the corresponding technical characteristics (power, antenna gain) as well as the MMSS characteristics and the degree of deployment (density of systems per km2 per country, region and/or any other adequate representative figure) of the corresponding services in the corresponding frequency bands. Administrations are kindly requested to provide the corresponding characteristics.

* Study uplinks at 8GHz:
* Study MMSS protection distance needs of 8 GHz Fixed and Mobile services, perhaps adapting the solutions of Res 902 6GHz FSS ESVs as an example framework
* Study the feasibility of MMSS protection to MetSat.
* Study compatibility between MMSS and FSS
* Study downlinks at 7GHz:
* Study the feasibility of the Maritime Mobile Satellite Service 7375-7750 MHz using the same PFD as FSS to protect FS and MS.
* Study and confirm compatibility of MMSS to METSAT.
* Study and confirm on compatibility of FS to MMSS that as FS max power of +55dBW is in RR – MMSS to not claim protection from FS
* Study and confirm on compatibility of MS to MMSS that as MS max power of +55dBW is in RR – MMSS to not claim protection from MS
* Study compatibility between MMSS and FSS

# Relevant information from outside CEPT (examples of these are below)

## European Union (date of proposal)

## Regional telecommunication organisations:

## European Union (date of proposal)

## Regional telecommunication organisations:

APT (date of proposal)

ATU (date of proposal)

Arab Group (December 2013)

Not Supporting the allocation to the maritime-mobile satellite service and additional regulatory measures in the frequency bands 7 150-7 250 MHz and 8 025-8 400 MHz .

Following up the current studies

Prepare proposal to WP 4A to include NOC method

CITEL (January 2013)

Canada, United States:

If ITU-R studies demonstrate compatibility with incumbent services, including the adjacent SRS (space-to-Earth) allocation in the band 8 400-8 450 MHz, which is limited to deep space, Canada and the United States will consider supporting allocations to the MMSS in the bands 7 375-7 750 MHz and 8 025-8 400 MHz, or portions thereof. ITU-R studies should determine appropriate measures (e.g., exclusion zones, radiation limits etc.), that will be needed to ensure protection of existing services in the bands 7375 – 7750 MHz and 8025 - 8400 MHz.

RCC (April 2013)

The RCC administrations do not object to allocation of 7375-7750 MHz and 8025-8400 MHz bands to the maritime mobile-satellite service (MMSS) subject to compatibility with existing terrestrial and space services without imposing additional constraints on these services. The RCC administrations support the development of regulatory provisions for the allocation, given that the operation of the MMSS is supposed outside the territorial waters.

## International organisations

IATA (date of proposal)

ICAO (date of proposal)

IMO (date of proposal)

NATO (December 2013)

Preliminary NATO Military Position as of December 2013

If ITU-R studies demonstrate compatibility with incumbent services, including the adjacent SRS (space-to-Earth) allocation in the band 8 400-8 450 MHz, which is limited to deep space, NATO will support allocations to the MMSS in the bands 7 375-7 750 MHz and 8 025-8 400 MHz, or portions thereof.

SFCG (July 2013)

SFCG supports the protection of existing METSAT and EESS allocations as well as the protection of SRS (s-E) (deep space) allocation from adjacent band interference. No new allocations to the MMSS should be made in these frequency bands unless acceptable sharing conditions with the science services are agreed. Particular concern is noted with regard to potential interference to EESS (s-E) operations in 8025-8400 MHz at high latitudes from ships operating in proximity, and out-of-band interference to SRS (deep space) (s-E) reception in the 8400-8450 MHz band. Large exclusion zones would be needed to avoid interference to existing and future EESS and SRS earth stations. Many of the more than 100 existing EESS and SRS earth stations are located near coastal areas (e.g., Svalbard, McMurdo, Maspalomas, Lannion, Wallops) and could be seriously affected by emissions from vessels navigating in the area. SFCG considers that the enforcement of these large exclusion zones would not be feasible in practice, leading to interference that will be very difficult to track due to the mobile nature of the systems. It is also to be noted that any new EESS/SRS Earth station would require updating the database of the exclusion zones.

Therefore SFCG is opposed to this proposed allocation to MMSS.

WMO (January 2013)

WMO considers that no new allocations to the MMSS should be made in these frequency bands unless acceptable sharing criteria with EESS and MetSat are developed. Particular concern is noted with regard to potential interference to EESS (space-to-Earth) operations in 8 025-8 400 MHz at high latitudes from ships operating in proximity.

## Regional organisations

ESA (July 2013)

Same as SFCG

EUMETNET (February 2013)

Same as WMO

Eurocontrol (date of proposal)