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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”.

# 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 FS, MS, EESS (space-to-Earth) and MMSS in the band 8025-8400 MHz requires the establishment of large exclusion zones around the EESS earth stations and FS, MS 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 make 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.

Taking into account that a number of applications expected to be used by the MMSS systems do not have symmetric spectrum needs, requiring more important bandwidth for the space-to-Earth link and considering that the sharing studies showed compatibility between the space stations of MMSS (space-to-Earth) and the existing services in the band 7 375-7 750 MHz, CEPT supports the allocation to the MMSS (space-to-Earth) in this band. This allocation should be limited to geostationary satellites and is subject to the condition that earth stations in the MMSS systems do not claim protection from, nor constrain the use or development of the existing terrestrial services in this band. No 5.43A does not apply. Sharing with space services currently allocated in this frequency band can be achieved through coordination under RR Article 9.

# 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 group 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. The results associated to such studies are described in the draft CPM text on A.I. 1.9.2 as well as in Report ITU-R M.[MMSS 7/8 GHZ SHARING] - Possible allocations to the maritime mobile-satellite service in the 7/8 GHz range.

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

Multiple studies, in the band 7 375-7 750 MHz, noted that the interference characteristics from a space station in the proposed MMSS into the fixed service are identical to the interference characteristics from a space station in the existing FSS into the FS. The terrestrial FS is protected from the FSS by a pfd limit applicable to the FSS, which is given in No. 21.16 (Table 21-4). It is further noted that the same pfd limit also applies to the MSS, and thus it would also apply to the proposed MMSS.

Based on the results of the sharing study in the band 8 025-8 400 MHz, the calculated separation distances of 317 km from the territorial coast line are required to protect FS stations from one MMSS earth station. It is noted that there are four primary services sharing the 8 025-8 400 MHz frequency band, namely, EESS (s-E), FS, FSS (E-s) and MS. Some of the systems in these services could potentially interfere with an FS system in addition to multiple MMSS earth stations. Hence, the required separation distance would be larger than the separation distance due to a single MMSS earth station alone.

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

Multiple studies, in the band 7 375-7 750 MHz, noted that the interference characteristics from a space station in the proposed MMSS into the MS (except aeronautical mobile) are identical to the interference characteristics from a space station in the existing FSS into the MS (except aeronautical mobile). The existing MS (except aeronautical mobile) is protected from the FSS by a pfd limit applicable to the FSS, which is given in No. 21.16 (Table 21-4). It is further noted that the same pfd limit also applies to the MSS, and thus it would also apply to the proposed MMSS.

Protection of the MS from interference by the proposed MMSS (E-s) in the frequency band 8 025-8 400 MHz could be provided by using protection distances specified for MMSS earth stations. In such case it would be required to determine appropriate performances of MMSS and MS for incorporation into RR Appendix 7 or for calculation of coordination distances. However, the CEPT has expressed concerns with regard to this solution.

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

No technical studies regarding sharing between the MMSS and the FSS in the 7 375-7 750 MHz and 8 025-8 400 MHz bands have been performed. However, if MMSS operations in the band would be limited to GSO systems and the interference characteristics between MMSS and FSS would therefore be the same as between two FSS systems, sharing can be accomplished through coordination under RR Article 9.

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

No technical studies regarding sharing between MMSS and MetSat in the frequency bands 7 375–7 750 and 8 175-8 215 MHz have been performed. However, if MMSS operations in the band would be limited to GSO systems and the interference characteristics between MMSS and systems in the MetSat would be the same as between FSS and MetSat systems, it is expected that sharing can be accomplished through coordination under RR Article 9.

### 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 by 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 station. 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 range from 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 MMSS terminal operating on a single channel. In case of multiple MMSS terminals operating on multiple channels, the required exclusion zone may grow. 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 distances 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 from 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 MMSS terminal operating on a single channel. In case of multiple MMSS terminals operating on multiple channels, the required exclusion zone may 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

* Report of the CPM on operational and regulatory/procedural matters to the World Radiocommunication Conference 2015 – Chapter 4 Satellite services - Agenda item 1.9.2
* 4/92 - Report ITU-R M.[MMSS 7/8 GHz SHARING] - Possible allocations to the maritime mobile-satellite service in the 7/8 GHz range (approved at the June 2015 meeting of SG4).

# Actions to be taken

None

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

## European Union (date of proposal)

## Regional telecommunication organisations:

APT (July 2015)

APT has adopted a PACP NOC for the uplink (8 GHz band) but there is no PACP for the downlink (7 GHz band).

ATU (July 2015)

Not in favour of the allocation of this band because of the heavy usage in Africa of terrestrial services.

ASMG (July 2015)

Does not support the allocation to the maritime-mobile satellite service in the frequency bands 7 150-7 250 MHz and 8 025-8 400 MHz.

CITEL (August 2015)

An IAP NOC has been adopted by CITEL.

RCC (September 2015)

The RCC Administrations oppose the allocation of the frequency band 8025-8400 MHz to the maritime mobile-satellite service since the ITU-R studies have shown that compatibility of the MMSS with other space services is not possible without imposing additional constraints on them.

The RCC Administrations do not oppose the allocation of the frequency band 7375-7750 MHz (space to Earth) to the maritime mobile-satellite service since the ITU-R studies have shown that compatibility of the MMSS with other space services is possible without imposing additional constraints on them.

## International organisations

IATA (date of proposal); ICAO (date of proposal); IMO (date of proposal)

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NATO (June 2015)

NATO does not support a new allocation to MMSS (Earth-to-space) in the   
8025-8400 MHz band because of sharing difficulties with existing services. Noting however that ITU-R studies show a possible compatibility with other services in the 7375-7750 MHz band, NATO may consider a possible new allocation to the MMSS (space-to-Earth) in this band provided it does not create additional regulatory burden for military operations..

SFCG (March 2015)

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 the frequency band 8025-8400 MHz. 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 up to distances of hundreds of km from the coastline. 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 (March 2015)

If an allocation to the MMSS (space-to-Earth) in the frequency band 7 450 – 7 550 MHz is applied, the relevant protection of MetSat systems has to be ensured.

Based on the ITU-R study results WMO opposes a new allocation of the frequency band 8 025-8 400 MHz to the MMSS (Earth-to-space) and supports no change to the Radio Regulations (i.e. Method A in Draft CPM Report).

CRAF (June 2015)

Regarding the Methods developed to satisfy this part of the agenda item in the CPM text for WRC-15 Agenda item 1.9.2, CRAF supports method A (NOC); approves Method B, option B (adoption of a Resolution, referenced in a footnote that would respect the exclusion zones around SRS deep space earth stations) and opposes Method B, option A.

## Regional organisations

ESA (June 2014)

Aligned with SFCG position.

EUMETNET (September 2014)

Same as WMO

Eurocontrol (date of proposal)

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