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|  |  Doc. CPG(17)024 ANNEX IV-03 |
| CPG19-4 |
| Cluj Napoca, Romania, 4th - 7th July 2017 |
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| Date issued:  | 7th July 2017 |
| Source:  | Minutes CPG19-4 |
| Subject:  | Draft CEPT Brief on WRC-19 Agenda Item 1.3 |
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| Summary:  |
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| Proposal: |
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DRAFT CEPT BRIEF ON AGENDA ITEM 1.3

1.3 to consider possible upgrading of the secondary allocation to the meteorological-satellite service (space-to-Earth) to primary status and a possible primary allocation to the Earth exploration-satellite service (space-to-Earth) in the frequency band 460-470 MHz, in accordance with Resolution 766 (WRC-15);

# ISSUE

Resolution 766 (WRC-15) invites WRC-19 to consider, based on the results of ITU Radiocommunication Sector (ITU-R) studies, the possibility of upgrading the secondary MetSat (space-to-Earth) allocation to primary status and adding a primary EESS (space-to-Earth) allocation in the frequency band 460-470 MHz, while providing protection and not imposing any additional constraints on existing primary services to which the frequency band is already allocated and in the adjacent frequency bands.

# Preliminary CEPT position

CEPT supports that the MetSat (space-to-Earth) allocation should be upgraded from secondary to primary status and a primary EESS (space-to-Earth) allocation should be added in the frequency band 460-470 MHz provided that

priority of MetSat over EESS as currently expressed in the RR is retained;

the protection of primary services in the frequency band and in adjacent frequency bands is ensured

the primary services in this frequency band are not constrained by an upgrade of the Metsat allocation to primary status and an addition of primary EESS allocation.

# Background

Data Collection Systems (DCS) operate on geostationary and non-geostationary orbits in the meteorological‑satellite service (MetSat) and the Earth exploration-satellite service (EESS) (Earth‑to-space) systems in the frequency band 401-403 MHz (uplink) and 460-470 MHz (downlink). DCS systems are essential for monitoring and predicting climate change, monitoring ocean, and water resources, weather forecasting and assisting in protecting biodiversity, as well as improving maritime security.

Data collection systems have been operating globally under a secondary allocation and on a primary basis in some countries under No 5.290, but this use is constrained by coordination under Article 9.21. This has led to differing limitations and protection criteria and has posed a barrier to implementation of essential DCS components on a global basis.

One of the EESS/MetSat usages comprises the data collection platforms gathering information activity related to the Earth, the environment and scientific application, weather and environment observation. The data, which are collected by ground platforms, are sent to the corresponding satellites that retransmit the retrieved information to dedicated earth stations. DCS are particularly useful for the collection of data from remote and inhospitable locations where it may provide the only possibility for data relay. Even so, the system has very many uses in areas with a highly developed infrastructure. The installations required for relay of the data tend to be inexpensive, unobtrusive and normally blend easily into the local environment.

The frequency band 460-470 MHz is currently allocated to the MetSat service (space-to-Earth) on a secondary basis. However, it is to be noted that the MetSat service is primary in a few countries according to No 5.290.

According to No. 5.289, Earth exploration-satellite service applications, other than the meteorological-satellite service, may also be used in the bands 460‑470 MHz and 1 690-1 710 MHz for space-to-Earth transmissions subject to not causing harmful interference to stations operating in accordance with the Table of Allocations.

Amongst others, this band is currently used by the Advanced Data Collection System (A-DCS) also called ARGOS which is a unique worldwide location and data collection system dedicated to studying oceans and atmospheric conditions, preserving and monitoring wildlife, volcanoes, fishing fleets, shipments of dangerous goods, humanitarian applications and managing water resources.

DCS help the scientific community to better monitor and understand our environment, but also helps industry to comply with environmental protection regulations implemented by various governments. This positioning capability also permits applications such as monitoring drifting ocean buoys and studying wildlife migration paths.

A primary allocation to the MetSat service and EESS (downlink) in the frequency band 460-470 MHz would provide confidence to space and meteorological agencies deeply involved in Satellite Data Collection Programs and the public sectors funding the development and operation of such systems. These space programs have been representing a long term effort and investment for decades between the time when the program is officially decided, the development, the launch phase, the time when the various satellites are in operation, keeping in mind that usually many satellites are deployed in order to provide a continuous service. In addition, space and meteorological agencies are investing in the continuity of these programs providing subsequent satellites and payloads. An upgrade would also provide the necessary long-term continuity for these programs of public interest.

An upgrade of the existing MetSat allocation and a new primary EESS allocation would allow operators of Data collection platforms to design and operate their systems with more confidence. Regulatory measures need to be developed to protect the mobile and fixed service. One method usually used to protect the incumbent terrestrial services from a satellite downlink signal, is to use an adequate pfd (power flux density) limit.

ITU-R Working Party (WP) 7B which is responsible for this agenda item began drafting a report regarding this agenda item. Preliminary information was provided regarding Space to Earth downlinks performed by GSO satellites. More detailed information for characteristics of the operating of NGSO DCS satellites is provided. Moreover, in order to have reduced pfd levels on the ground, future satellites may implement spread spectrum multiple access (SSMA) transmission techniques. The report also includes a draft list of the technical characteristics of the incumbent services, from several ITU-R Reports and Recommendations listed in the following section. A liaison was sent to WP5A, WP5C and WP5D, asking to confirm characteristics of the fixed and mobile systems deployed in the frequency band 460-470 MHz.

WP 5A indicated that for narrow band systems (systems having bandwidths such as 6.25 12.5 or 25 kHz), both Mobile Stations (MS) and Base Stations (BS) can be receiving in the 460-470 MHz. Recommendation ITU-R M.1808 indicates the list of required parameters: sensitivity, bandwidth, antenna gain and protection ratio. However, for systems having larger bandwidths (1 250 kHz in Recommendation ITU-R M.1808 or 1 230 kHz in Report ITU-R M.2110 referenced as CDMA450 from the IMT-2000 family) the mobile stations (MS) are receiving in the band 460-470 MHz. WP5D was asked to confirm the characteristics of the systems corresponding to the IMT-2000 family, and also the fact that these mobile stations use the higher part (460-470 MHz) of the duplex frequency 450-470 MHz for receiving.

According to Resolution 646 (Rev. WRC-15), this portion of the band is harmonised for the use by PPDR applications. Since CEPT envisages to implement PPDR applications within the frequency band 450-470 MHz, the corresponding pfd limit for BB (broadband) PPDR using LTE technology shall not exceed -147 dBW/m2/4kHz.

1. CEPT still has to provide corresponding protection limits for other types of systems (narrowband and wideband) operating in this frequency range.

In addition, the WP7B preliminary draft new report shows that the protection of the radio astronomy service in the frequency band 406.1-410 MHz from the NGSO DCS downlink emissions is ensured through a filtering pattern. Therefore, the EESS (space-to-Earth) for NGSO DCS emissions will not cause interference to the radio astronomy stations in the 406.1-410 MHz frequency band.

# List of relevant documents

## ITU-Documentation (Recommendations, Reports, other)

* Recommendation ITU-R F.699: Reference radiation patterns for fixed wireless system antennas for use in coordination studies and interference assessment in the frequency range from 100 MHz to about 70 GHz
* Recommendation ITU-R F.755: Point-to-multipoint systems in the fixed service
* Recommendation ITU-R F.758: System parameters and considerations in the development of criteria for sharing or compatibility between digital fixed wireless systems in the fixed service and systems in other services and other sources of interference
* Recommendation ITU-R M.478: Technical characteristics of equipment and principles governing the allocation of frequency channels between 25 and 3 000 MHz for the FM land mobile service
* Recommendation ITU-R M.1767: Protection of land mobile systems from terrestrial digital video and audio broadcasting systems in the VHF and UHF shared bands allocated on a primary basis
* Recommendation ITU-R M.1808: Technical and operational characteristics of conventional and trunked land mobile systems operating in the mobile service allocations below 869 MHz to be used in sharing studies
* Report ITU-R M.2039: Characteristics of terrestrial IMT-2000 systems for frequency sharing/interference analyses
* Report ITU-R M.2110: Sharing studies between radiocommunication services and IMT systems operating in the 450-470 MHz band dated 2007
* Annex 20 to Working Party 7B Chairman’s Report, October 2016: Preliminary Draft New Report ITU-R SA.[460 MHZ METSAT-EESS]: Studies related to proposed change in 460-470 MHz secondary allocation for MetSat to primary and addition of primary allocation to EESS

## CEPT and/or ECC Documentation (Decisions, Recommendations, Reports)

* ECC Decision EEC/DEC/(16)02: Harmonised technical conditions and frequency bands for the implementation of (BB-PPDR) systems
* ECC Decision EEC/DEC/(08)05: Harmonisation of frequency bands for the implementation of digital PPDR radio applications in 380-470 MHz range
* ECC Decision EEC/DEC/(06)06: Narrow Band Digital Land Mobile PMR/PAMR in the 80 MHz, 160 MHz and 400 MHz bands
* ECC Decision EEC/DEC/(04)06: Wide Band Digital PMR/PAMR in the 400 MHz and 800/900 MHz
* ECC Report 240: Studies for BB PPDR and other applications in 410-430 and 450-470 MHz and adjacent bands
* ECC Report 218: Harmonised conditions and spectrum bands for the implementation of future European BB-PPDR systems
* ECC Report 104: Mobile systems in the band 450-470 MHz vs DVB-T in UHF TV channel 21
* ECC Report 39: Impact of CDMA-PAMR on 12.5/25 kHz PMR/PAMR in 410-430/450-470 MHz

## EU Documentation (Directives, Decisions, Recommendations, other), if applicable

# Actions to be taken

Determine planned and operational technical characteristics of EESS and MetSat systems in the band 460-470 MHz

Determine technical and operational characteristics of FS and MS systems operating in the band 460-470 MHz

Provide the corresponding pfd limits for other types of mobile and fixed systems (narrowband and wideband) operating in this frequency range and study appropriate sharing criteria.

Examine possible regulatory actions

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

## European Union (date of proposal)

## Regional telecommunication organisations

APT (date of proposal)

ATU (date of proposal)

ASMG (20 April 2017)

* These frequency bands are widely used in Arab countries for mobile and fixed services.
* ASMG doesn’t support the possible upgrading of the secondary allocation to the meteorological satellite service (space-to-earth) to primary status and a primary allocation to the Earth exploration satellite service (space-to-earth) in the frequency band 460-470MHz.
* Follow up studies under this agenda item and ensure the protection of the existing services.

CITEL (date of proposal)

RCC ( 14 April 2017)

The RCC Administrations consider that there is a need to harmonize frequency allocations used by data collection systems (DCS) in the meteorological-satellite service and the Earth exploration-satellite service.

However upgrading the secondary allocation to the meteorological-satellite service (space-to-Earth) to a primary status and a primary allocation to the Earth exploration-satellite service (space-to-Earth) in the frequency band 460-470 MHz are possible under the following conditions:

* The protection of the terrestrial services to which the frequency band 460-470 MHz is allocated on a primary basis;
* The proposed measures for the protection of the terrestrial services will not impose additional constraints on the existing satellite systems and the networks operated within meteorological-satellite service and the Earth exploration-satellite service;
* Maintaining priority of the meteorological-satellite service over the Earth exploration-satellite service.

## International organisations

IATA (date of proposal)

ICAO (September 2016)

No position so far

IMO (July 2016)

Protection of the existing maritime mobile service used for on-board communication stations to which the frequency band is already allocated in primary basis should be ensured, and no additional constraints should be imposed.

NATO (27 June 2017)

This NATO military assessment summary is a common military assessment of the NATO Nations on the potential impacts and benefits of Agenda Item 1.3. It does not constitute a common position of the NATO Nations.

Several NATO nations are using the band 460 - 470 MHz for various types of military applications, mostly in the mobile service (PMR) on a shared basis with other users depending on countries.

SFCG (June 2016)

SFCG supports studies and analyses under Agenda Item 1.3 and the effort to raise the status of MetSat and EESS space-to-Earth usage. SFCG recognizes the need for harmonization of the global operating environment to allow full development of critical MetSat systems.

The MetSat (space-to-Earth) allocation should be upgraded from secondary to primary status and a primary EESS (space-to-Earth) allocation should be added in the frequency band 460-470 MHz while providing protection and not imposing any additional constraints on existing primary services to which the frequency band is already allocated or in the adjacent frequency bands. This should be realised while retaining the priority of MetSat over EESS as currently expressed in the RR. The SFCG does not support limitations on an upgraded allocation which would make the allocation effectively unusable.

WMO and EUMETNET (21 November 2016)

Support the upgrading to primary of the METSAT (s-E) allocation in the frequency band 460-470 MHz

Support a primary allocation to the EESS (s-E) in the frequency band 460-470 MHz provided the priority of METSAT is maintained.

EUMETSAT (October 2016)

EUMETSAT supports the SFCG position on this WRC-19 agenda item.

## Regional organisations

ESA (October 2016)

ESA supports the SFCG position on this WRC-19 agenda item.

Eurocontrol (date of proposal)

## OTHER INTERNATIONAL AND REGIONAL ORGANISATIONS

EBU (date of proposal)

GSMA (date of proposal)

CRAF (September 2016)

No position so far