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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 that a primary EESS (space-to-Earth) allocation should be added in the frequency band 460-470 MHz provided that

the protection of primary services in the frequency band and in adjacent frequency bands is ensured by the introduction of relevant pfd masks for GSO and non-GSO satellites

“MetSat and EESS earth stations shall not claim protection from stations in the fixed and mobile services”, as stated in recognizing f) of Resolution 766

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

# 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 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.

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.

Amongst others DCS, the Advanced Data Collection System (A-DCS), also called ARGOS, is a unique worldwide location and data collection system dedicated to study oceans and atmospheric conditions, preserve and monitor wildlife, volcanoes, fishing fleets, shipments of dangerous goods, humanitarian applications and manage 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.

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, but this use is subject to agreement obtained under Article 9.21. This has led to different limitations and has posed a barrier to implementation of essential DCS components on a global basis.

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 RR Article 5.

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.

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 appropriate pfd (power flux density) limit.

ITU-R Working Party (WP) 7B which is responsible for this agenda item is drafting a Report regarding this agenda item. A revised version of this PDN Report provides an almost complete list of technical elements related to EESS and METSAT as well as other incumbent services in the band 460-470 MHz. Moreover, in order to have appropriate 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. An important step has been made to synthetize technical elements in order to propose a single set of parameters to be used in studies toward the derivation of relevant pfd limits to protect incumbent services operated in-band or in adjacent bands.

WP5A, WP5C and WP5D provided WP7B the list of systems and characteristics of the fixed and mobile systems deployed in the frequency band 460-470 MHz.

WP5D also confirmed 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.

WP5A also indicated that Report ITU-R M.2014 contains information on the digital land mobile systems for Land Mobile services including PPDR. Radio interface standards for PPDR are included in Recommendation ITU‑R M.2009.

Studies provided in the ITU-R PDNR “Studies related to proposed change in 460-470 MHz secondary allocation for MetSat to primary and addition of primary allocation to EESS”, show that the following pfd mask for non-GSO satellites has been agreed to ensure protection of the mobile and fixed services:

The pfd mask was agreed by ITU-R WP 5A and 5C.

Furthermore, CEPT studies show that the following pfd mask for GSO satellites will ensure protection of the Fixed and Mobile services:

In addition, the ITU-R PDNR “Studies related to proposed change in 460-470 MHz secondary allocation for MetSat to primary and addition of primary allocation to EESS” shows that the protection of the radio astronomy service in the frequency band 406.1-410 MHz from the non-GSO DCS downlink emissions is ensured through a filtering pattern. Therefore, the EESS (space-to-Earth) for non-GSO DCS emissions will not cause interference to the radio astronomy stations in the 406.1-410 MHz frequency band.

Similarly, this ITU-R PDN Report also shows that non-GSO MetSat and EESS satellites will not cause interference to the broadcasting service in the adjacent band.

At its last meeting in May 2018, ITU-R WP 7B agreed on the draft CPM text for agenda item 1.3. Two methods are proposed. Method A is NOC. Method B proposes an upgrade of the MetSat (space-to-Earth) allocation from secondary to primary status and an addition of a primary EESS (space-to-Earth) allocation in the frequency band 460-470 MHz. In method B, two options are included proposing different pfd masks for geostationary satellites. The pfd mask in option 1 is equal to the pfd mask shown above in this draft CEPT brief. Therefore, method B, option 1 is almost in line with the draft CEPT brief and the draft ECP. In addition, method B proposes regulatory measures, in particular a new Resolution, to grandfather operating systems.

# 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 19 to Working Party 7B Chairman’s Report, April 2017: 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

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

## European Union (date of proposal)

## Regional telecommunication organisations

APT (June 2018)

APT Members support the ITU-R studies in accordance with Resolution 766 (WRC-15) to conduct and complete, in time for WRC-19, the necessary technical, operational and regulatory studies on the possibility to upgrade the secondary allocation of 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 460-470 MHz, provided that the appropriate measures are taken to ensure the protection of existing fixed, mobile, and broadcasting services and not to constrain their future developments in the frequency band 460-470 MHz and in adjacent bands, and stations of the EESS and MetSat services shall not claim protection from the fixed and mobile services. APT Members also note that the priority of MetSat over EESS should be maintained.

ATU (21 September 2018)

Method A of the Draft CPM Text (No change)

ASMG (11 April 2018)

* Due to the heavily used for the frequency band 460-470 MHz in the Arab countries for mobile and fixed services, so initially 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 460-470 MHz.
* Follow up studies under this agenda item and ensure the protection of the existing services.

CITEL (June 2018)

No preliminary view on this agenda item yet.

Preliminary views from a few countries supporting studies:

Upgrade MetSat and new EESS allocations in 460-470 MHz band, to provide certainty for sensors critical for hurricane forecasting while protecting fixed and mobile services, including IMT.

RCC (22 November 2018)

* The RCC administrations support upgrading the secondary allocation to the meteorological-satellite service (space-to-Earth) to a primary status as well as a primary allocation to the Earth exploration-satellite service (space-to-Earth) in the frequency band 460-470 MHz under the following conditions:
* Upgrading the status of allocations of the frequency bands to the meteorological-satellite service and the Earth exploration-satellite service shall be applied both for future systems as well as existing systems of these radio services;
* For the protection of the terrestrial services to which the frequency band 460-470 MHz is allocated on a primary basis, which ensure acceptable interference level, pfd limits for the specified satellite services shall be established to ensure acceptable interference level. In case of non-compliance with these limits, satellite systems of specified services can continue to be used on the secondary basis;
* Maintaining priority of the meteorological-satellite service over the Earth exploration-satellite service should be ensured.
* The RCC administrations do not support segmentation of the frequency band 460-470 MHz for geostationary and non-geostationary satellite systems.

## International organisations

IATA (date of proposal)

ICAO (September 2016)

No position so far

IMO (July 2017)

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

SFCG (September 2018)

SFCG supports raising the regulatory status of MetSat and EESS space-to-Earth allocations as proposed by Method B of the draft CPM text (ITU-R WP 7B Chairman Report 7B/326 Annex 2).

SFCG recognizes the need for harmonization of the global operating environment to allow full development of critical MetSat/EESS systems.

SFCG is of the opinion 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 while providing protection for and not imposing any additional constraints on existing primary services to which the frequency band is already allocated. This should be realised while retaining the priority of MetSat over EESS as currently expressed in the RR. The SFCG supports the pfd mask for non-GSO satellites contained in Method B of the draft CPM text, and encourages SFCG member agencies to further develop a suitable pfd mask for GSO satellites.

WMO and EUMETNET (June 2018)

WMO supports the upgrade of the METSAT (space-to-Earth) allocation to primary in the frequency band 460-470 MHz with the use of an appropriate PFD limits for GSO and non-GSO satellites to protect incumbent services.

WMO also supports creation of a primary allocation to the EESS (space-to-Earth) in the frequency band 460-470 MHz with the use of an appropriate PFD limits for GSO and non-GSO satellites to protect incumbent services, while retaining the priority of MetSat service over EESS as currently expressed in footnote RR No. 5.289.

EUMETSAT (October 2016)

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

## Regional organisations

ESA (October 2018)

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

Eurocontrol (date of proposal)

## OTHER INTERNATIONAL AND REGIONAL ORGANISATIONS

EBU (November 2018)

EBU supports the CPM text which includes pfd limits for the downlink emission of non-GSO and GSO satellites as a function of the angle of arrival which ensure protection to incumbent services in the 460-470 MHz band. As per PDN Report ITU-R SA.[460 MHZ METSAT-EESS] which provides the studies and compiles elements related to this agenda item, adjacent broadcasting services above 470 MHz would also be protected which such pfd limits.

Therefore, EBU supports the addition in the Radio Regulations of the new footnote 5.B13 as included in the CPM text.

GSMA (date of proposal)

CRAF (November 2018)

No position so far