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|  | | CPG15(15)084 Annex IV-19 |
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CEPT BRIEF ON AGENDA ITEM 1.18

1.18 to consider a primary allocation to the radiolocation service for automotive applications in the 77.5-78.0 GHz frequency band in accordance with Resolution 654 (WRC12).

# ISSUE

Resolution 654 (WRC 12) invites ITU-R:

resolves to invite WRC-15

to consider a primary allocation to the radiolocation service in the 77.5-78 GHz frequency band, taking into account the results of ITU-R studies, and

to conduct, as a matter of urgency, and in time for consideration by WRC‑15, the appropriate technical, operational and regulatory studies, including:

* 1. sharing studies and regulatory solutions to consider a primary allocation to the radiolocation service in the band 77.5-78 GHz, taking into account incumbent services and existing uses of the band;
  2. compatibility studies in the band 77.5-78 GHz with services operating in the adjacent bands 76-77.5 GHz and 78-81 GHz;
  3. spectrum requirements, operational characteristics and evaluation of ITS safety-related applications that would benefit from global or regional harmonization.

# CEPT position

CEPT supports a primary allocation to the radiolocation service to support short range radar applications in the frequency band 77.5-78.0 GHz in accordance with Resolution 654 (WRC-12) “Allocation of the band 77.5-78 GHz to the radiolocation service to support automotive short-range high-resolution radar operations”.

CEPT is of the opinion that the allocation to the radiolocation service in the RR shall not be restricted to applications and that the word “automotive”, as any other undefined terminology in the RR, shall not be used. CEPT recognises that radio-astronomy stations are to be protected from future use of the radiolocation in the frequency 77.5-78 GHz band.

# Background

There has been significant growth in the use of automotive radar systems, and these systems are expected to become relatively common place within a few years because of general demand for increased road safety. Radars based on the same characteristics, will also likely be used in other applications requiring collision avoidance capabilities.

In order to facilitate the development and deployment of automotive radar systems in Europe, the frequency ranges have been used at 24 GHz on a temporary basis due to incompatibilities with existing services, and 79 GHz on a permanent basis.

The 79 GHz band (77-81 GHz) is thus considered to be the long-term operating frequency for SRR within CEPT.

Studies have shown that the use of collision avoidance technology can prevent or lessen the severity of significant number of traffic accidents. In certain parts of the world, automotive radars have successfully operated particularly in the 76-77 GHz band, for many years without mitigation methods or deactivation methods and without increased reports of interference to licensed services.

Portions of 76-81 GHz band are allocated to the radio astronomy service (RAS), amateur and amateur-satellite and radiolocation services (RLS) on a primary or secondary basis and to the space research (space-to-Earth) service on a secondary basis. At these frequencies, radio propagation decreases more rapidly with distance than at lower frequencies and antennas that can narrowly focus transmitted energy are practical and of modest size. While the limited range of such transmissions might appear to be a major disadvantage for many applications, it does allow the reuse of frequencies within very short distances and, thereby enables a higher concentration of transmitters to be located in a geographical area than is possible at lower frequencies. The attenuation of the transmissions, however, varies with the water content of the atmosphere and some other atmospheric factors.

The ITU Council, in adopting Resolution 1318 (Council 2010), stated that ICTs, including intelligent transport systems (ITS), provide mechanisms for vehicular and passenger safety; and invited members of the union to take practical steps to further national and domestic policies, programs and/or educational initiatives in the use of ICTs to improve global road safety.

Status of the CEPT regulatory framework

* In 2001 ECC amended ECC/DEC/(02)01 “.. on the frequency bands to be designated for the co-ordinated introduction of Road Transport and Traffic Telematic Systems” (RTTT) in which the frequency band 76.0 to 77.0 GHz is designated for vehicular radars. This decision is withdrawn in 2012 and replaced by amended ANNEX 5 in ERC Recommendation 70-03 (ANNEX 5: ROAD TRANSPORT AND TRAFFIC TELEMATICS (RTTT))
* ECC/DEC/(04)03 ECC Decision of 19 March 2004 on the frequency band 77–81 GHz to be designated for the use of Automotive Short Range Radars

## Regulatory status of radiolocation service in the 76-81 GHz band

Currently the 76-77.5 GHz and 78-81 GHz bands are globally allocated to the radiolocation service on a primary basis.

For the frequency range 77.5 - 78 GHz footnote 5.149 applies.

An additional global primary allocation to the radiolocation service in the 77.5-78 GHz band provides a harmonized, contiguous band for collision avoidance related short range radar applications in the 76-81 GHz band.

# List of relevant documents

ITU-Recommendations:

* ITU-R M.1452-2 – Millimetre wave vehicular collision avoidance radars and radiocommunication systems for intelligent transport system applications.
* ITU-R M.2057-0 (02/2014) System characteristics of automotive radars operating in the frequency band 76-81GHz for intelligent transport systems applications

Further ITU documents:

* Updated information/documentation on the ITU-R Preparatory Studies for WRC-15 is available at <http://www.itu.int/ITU-R/go/rcpm-wrc-15-studies>
* Report ITU-R M.2322 - Systems characteristics and compatibility of automotive radars operating  
  in the frequency band 77.5‑78 GHz for sharing studies
* Annex 9 of Doc. 5B/636: Working document towards DRAFT CPM text “Chapter 3. Aeronautical, maritime and radiolocation issues. AGENDA ITEM 1.18”
* Annex 10 of Doc. 5B/636: “Work plan for WRC-15. AGENDA ITEM 1.18”
* Liaison Statement from WP5A to WP5B (5B/157) Information on amateur service systems at 77.5 – 78 GHz
* Annex 2 to Doc. 7D/111-E: Working document toward a preliminary draft new report ITU-R RA.[RAS-VRADAR] “Considerations related to compatibility between the radio astronomy service and automotive applications of the radiolocation service in the 76-81 GHz band”

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

ECC Report 56 “Compatibility of automotive collision warning short range radar operating at 79 GHz with radiocommunication services”, Stockholm, October 2004.

ERC Recommendation 70-03 (9th October 2012) Annex 5

ETSI standard EN 302 264, Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices; Road Transport and Traffic Telematics (RTTT); Short Range Radar equipment operating in the 77 GHz to 81 GHz band, 2009, which is under revision (LS from ETSI to WP5A, Document 5A/159-E)

ECC Report 222. The impact of Surveillance Radar equipment operating in the 76 to 79 GHz range for helicopter application on radio systems

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

2004/545/EC: Commission Decision of 8 July 2004 on “the harmonisation of radio spectrum in the 79 GHz range for the use of automotive short-range radar equipment in the Community” (notified under document number C(2004) 2591)(Text with EEA relevance), Official Journal L 241, 13/07/2004 P. 0066 – 0067

# Actions to be taken

none

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

## European Union (date of proposal)

The band in question is harmonised for automotive short-range radar in the European Union since 2004

## Regional telecommunication organisations:

APT ( APG15-5, August 2015, Soul, Korea)

PACP: APT Members support a primary allocation to the radiolocation service for automotive applications in the 77.5-78.0 GHz frequency band, and the use of the band by the radiolocation service is limited to radar systems in accordance with the most recent version of Recommendation ITU-R M.2057.

ATU ( APM15-4 , 20 - 24 July 2015, Nairobi, Kenya)

APM15-4 Outcome (African Common Position): APM supports a primary allocation to the RLS on a worldwide basis limited to automotive applications. " Method A "

Arab Group ( 20th ASMG: 22-27 August 2015, Rabat, Morocco)

ASMG supports a primary allocation to the RLS on a worldwide basis, limited to automotive applications only, between 77.5 GHz and 78 GHz as per CPM Method A option 2.

CITEL ( 19th August 2015)

MOD Article 5 for a primary allocation to the radiolocation service in the frequency band 77.5-78 GHz

ADD No. 5.A118 to note that the use of the 77.5-78 GHz frequency band by the radiolocation service is limited to short range radar surface applications, including automotive applications. The provisions of No. 4.10 do not apply.

RCC ( 23rd April, 2015)

The RCC administrations support the worldwide allocation between 77.5 and 78.0 GHz to the radiolocation service on a primary basis for short range radar applications with technical characteristics described in Recommendation ITU-R M.2057 (based on the Option 1 of Method A in CPM Report).

## International organisations

IARU (29 March 2013)

IARU Position

Currently the only primary incumbent services in the band 77.5-78.0 GHz are the amateur and amateur-satellite services. These services also have secondary allocations in the adjacent bands of 76.0-77.5 GHz and 78.0-81.5 GHz. Amateur experimentation in the band is ongoing.

When allocations to services between 71 GHz and 84 GHz were made for the first time at WARC-79, the amateur and amateur-satellite services received a primary and exclusive allocation of 75.5-76.0 GHz and a secondary allocation of 76.0-81.0 GHz. The allocation of 75.5-76.0 GHz was withdrawn at WRC-2000 and as compensation the band 77.5-78.0 GHz was upgraded to primary and No. 5.561A was added, creating a new secondary allocation to the amateur services at 81.0-81.5 GHz.

The IARU acknowledges that there are significant benefits to be gained from worldwide standards for technologies such as automotive radars. However, automotive radars are classic examples of short- range devices (SRDs) for which, in general, allocations are neither essential nor appropriate.

Should a primary allocation to the radiolocation service for automotive applications nonetheless be added to the 77.5 – 78.0 GHz frequency band, the IARU earnestly requests that the primary allocation to the amateur and amateur-satellite services be maintained; or, in the alternative, that a suitable replacement allocation be provided on a primary basis within the band 71 – 84 GHz.

IATA (date of proposal)

ICAO (September 2015 )

To support the allocation of the frequency band 77.5 - 78 GHz to the radiolocation service in such a way as not to preclude its use on an advisory basis by taxiing aircraft.

IMO (date of proposal)

NATO (date of proposal)

SFCG ( August 2015)

Potentially affected space science service bands are: 77.5-78 GHz srs (s-E); 76-77.5 GHz srs (s-E); 78-79 GHz srs (s-E); and, 79-81 GHz srs (s-E).

SFCG Objective

SFCG supports the protection of existing space science service allocations. SFCG further supports a radiolocation allocation in 77.5-78 GHz for automotive applications as a means of removing such applications from the 23.6-24 GHz band. Preference is expressed to restrict the use of the potential radiolocation allocation to automotive radars to avoid application of these radars on helicopters, since this would potentially affect earth stations of SRS. Therefore SFCG supports Method A of the CPM Report.

ASFCG (EACP Position, September 2015)

Support the allocation of the frequency band 77.5 - 78 GHz to the radiolocation service in such a way as not to preclude its use on an advisory basis by taxiing aircraft.

WMO (March 2014)

WMO supports a primary allocation to the radiolocation service in the 77.5-78 GHz frequency band under the assumption that this new allocation to the radiolocation service will facilitate moving automotive applications out of the 24 GHz “passive” frequency band currently used by automotive radars.

## Regional organisations

CRAF (September 2015)

Radio astronomical observations in the band 77.5 – 78.0 GHz are covered by Footnote 5.149 and have a secondary allocation. Interference from the proposed allocation will practically affect the entire 77.5-81 GHz RAS band due to the foreseen bandwidth usage of these radars. Studies presented in ITU-R M.2322 show that exclusion zones of ~40 km would be needed around observatories to ensure protection of the RAS from the automotive application of these radars.

On-going studies also include airborne SRR applications up to heights of several hundred meters in this frequency range, in helicopters, on airplane wing tips to avoid collisions at airports, on cranes, and in road infrastructure to monitor traffic. These applications differ from the automotive application by a (much) higher altitude above the ground, resulting in significantly larger areas that are impacted by the radar. For instance, for the helicopter application exclusion zones to RAS observatories in the order of 100 km are required.

CRAF Position

Two methods are proposed to satisfy AI 1.18:

Method A: Adds a primary allocation to the radiolocation service between 77.5 GHz and 78 GHz on a worldwide basis, limited to automotive applications via a footnote setting limitations on power levels and height of radars above ground.

Method B: Adds a primary allocation to the radiolocation service between 77.5 GHz and 78 GHz on a worldwide basis, not limited to automotive applications.

CRAF does not approve either of the methods as long as no protection criteria for RAS are considered and reflected in appropriate regulation. CRAF welcomes any method that includes regulation for performing compatibility and sharing studies and coordination between RAS and future RLS applications.

Until proper regulatory provisions to protect the RAS are implemented, CRAF prefers Method A that limits the use of the proposed RLS allocation to automotive applications only.

ESA (September 2014)

Support SFCG positions

EUMETNET (September 2014)

Support WMO positions

Eurocontrol ( September 2015)

Support ASFCG