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| Porto, Portugal 2nd - 5th June 2015 | |  |
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| Subject: | CEPT Brief on WRC-15 Agenda Item 1.8 | |
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| Summary: | | | |
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| Proposal: | | | |
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DRAFT CEPT BRIEF ON AGENDA ITEM 1.8

1.8 to review the provisions relating to earth stations located on board vessels (ESVs), based on studies conducted in accordance with Resolution 909 (WRC-12)

# ISSUE

Resolution 909 (WRC-12)

“recognizing

* 1. that there are several other services than FSS to which the frequency bands 5 925-6 425 MHz and 14-14.5 GHz are allocated;
  2. that these other services need to be protected,

resolves to invite ITU-R

1. to review the provisions relating to ESVs which operate in the FSS in the uplink bands 5 925-6 425 MHz and 14-14.5 GHz and consider possible modifications to Resolution 902 (WRC 03) in order to reflect current ESV technologies and technical characteristics that are being used or planned to be used, while protecting the other services referred to in recognizing a) and b) above;
2. to complete the referenced studies in time for WRC 15.”

# CEPT position

CEPT considers that possible modifications to Resolution 902 (WRC-03) with the purpose to reflect current ESV technologies and technical characteristics of the earth stations on board vessels (ESVs) should ensure that the other services are protected and should not limit their further development.

CEPT supports keeping the existing approach based on the use of protection distances to ensure sharing between ESVs and other services in the frequency bands specified in Resolution 902 (WRC-03). CEPT supports establishing of a set of different protection distances for different maximum e.i.r.p. density levels towards horizon with the aim to reduce protection distances taking into account various technologies of ESV.

CEPT considers that the values of protection distances from a vessel up to a coast line in the C and Ku bands should be determined for different ESV classes according to the maximum e.i.r.p densities levels towards horizon, to ensure the protection of the terrestrial services in the frequency bands 5925-6425 MHz and 14-14.5 GHz.

Furthermore, statistical analysis of European maritime traffic evolution shows that the number of vessels passes assumed in WRC-03 has not increased. However, CEPT is of the view that the increase in the type and number of ships that could use ESV stations, as a consequence of a reduction of antenna size, has been taken into account in a consistent way within the studies.

Hence, CEPT supports Method D proposed in the CPM Report, defining a set of protection distances for different maximum e.i.r.p density levels and based on a consistent scenario with regards to the number of ship passes derived from up-to-date statistics.

# Background

Resolution 902 (WRC-03) introduced provisions relating to the use of earth stations on board vessels (ESVs) in certain bands allocated to the fixed-satellite service (FSS). In order to ensure the protection and future growth of other services, ESVs need to operate under certain technical and operational limitations. Based on agreed technical assumptions, minimum distances from the low-water mark as officially recognized by the coastal State have been calculated, beyond which an ESV will not have the potential to cause unacceptable interference to other services in the bands 5 925-6 425 MHz and 14-14.5 GHz. The minimum distances from the low-water mark as officially recognized by the coastal State beyond which ESVs can operate without the prior agreement of any administration are 300 km in the 5 925-6 425 MHz band and 125 km in the 14-14.5 GHz band, taking into account the technical limitations in Resolution 902 (Annex 2). Any transmissions from ESVs within the minimum distances shall be subject to the prior agreement of the concerned administration(s).

Since then Resolution 902 (WRC-03) was accepted, the technology used by ESVs has advanced considerably, including the use of spread-spectrum modulation and other techniques which may improve compatibility with terrestrial co-frequency services.

The use of some technologies renders possible the decrease of the protection distances from ESVs up to the coast line.

These are the main reasons why the technical and operational limitations and restrictions of Resolution 902 (WRC-03) need to be reviewed in light of the new technologies being put into operation at the ESVs.

It must be noted that the current version of Recommendation ITU-R S.1587-2 (2007) “Technical characteristics of earth stations on board vessels communicating with FSS satellites in the frequency bands 5 925-6 425 MHz and 14-14.5 GHz which are allocated to the fixed-satellite service” shows 6 GHz ESVs transmitting power densities as low as -11.3 dB(W/MHz), 24.3 dB lower than the value of 13 dB(W/MHz) used in the derivation of the Resolution 902 (WRC-03). Likewise, for the 14 GHz band, the current version of Recommendation ITU-R S.1587-2 shows ESVs transmitting power densities as low as -13.5 dB(W/MHz), 22 dB lower than the value of 8.5 dB(W/MHz) used in the derivation of the Resolution 902 (WRC-03).

Considering this document, the CEPT supports the combinations of various ‘minimum distances from ESVs according to appropriate values for e.i.r.p towards horizon, to take into account the new ESVs technologies and lower e.i.r.p while ensuring protection of Fixed Service with similar conditions than those previously defined when elaborating Resolution 902.

It was noted that, similarly to the existing Resolution 902, the modified Resolution 902 would contain three independent e.i.r.p limits applicable to ESVs: one per 1 MHz, one per 11.2 MHz or 14 MHz and one absolute value.

Furthermore, CEPT notes that Method C adopts a similar general approach as Method D, but contains slightly different values for off-shore distances.

# List of relevant documents

ITU-Documentation (Recommendations, Reports, other)

Resolution 909 (WRC-12) – Provisions relating to earth stations on board vessels which operate in fixed satellite service networks in the uplink bands 5 925-6 425 MHz and 14-14.5 GHz.

Resolution 902 (WRC-03) – Provisions relating to earth stations located on board vessels which operate in fixed-satellite service networks in the uplink bands 5 925-6 425 MHz and 14-14.5 GHz

Recommendation ITU-R SF.1650-1 – The minimum distance from the baseline beyond which in-motion earth stations located on board vessels would not cause unacceptable interference to the terrestrial service in the bands 5 925-6 425 MHz and 14-14.5 GHz.

Recommendation ITU-R SF.1649-1 – Guidance for determination of interference from earth stations on board vessels to stations in the fixed service when the earth station on board vessels is within the minimum distance.

Recommendation ITU-R SF.1585 – Example approach for determination of the composite area within which interference to fixed service stations from earth stations on board vessels when operating in motion near a coastline would need to be evaluated.

Recommendation ITU-R S.1587-2 – Technical characteristics of earth stations on board vessels communicating with FSS satellites in the frequency bands 5 925-6 425 MHz and 14-14.5 GHz which are allocated to the fixed-satellite service.

Document 4/110 – Draft new Report ITU-R S.[ESV] - Interference effect of transmissions from earth stations on board vessels operating in fixed-satellite service networks on terrestrial co-frequency stations (approved at the June 2015 meeting of Study Group 4)

CPM Report (WRC-15 Document 3)

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

ECC/DEC/(05)09 – ECC Decision of 24 June 2005 on free circulation and use of earth stations on board vessels operating in fixed-satellite fixed networks in the frequency bands 5 925-6 425 MHz (Earth-to-space) and 3 700-4 200 MHz (space-to-Earth)

ECC/DEC/(05)10 – ECC Decision of 24 June 2005 on free circulation and use of earth stations on board vessels operating in fixed-satellite service networks in the frequency bands 14-14.5 GHz (Earth-to-space), 10.7-11/7 GHz (space-to-Earth) and 12.5-12.75 GHz (space-to-Earth)

ECC/REC 14-01 (19/09/2014) – Radio-frequency channel arrangements for high capacity analogue and digital radio-relay systems operating in the band 5 925-6 425 MHz.

ECC Report 069 (28/06/2005) – Formats for submission of information from administrations to the Office on conditions for operation of earth stations aboard vessels within the separation distances identified in ITU-R Resolution 902 (The ESV Contour Report).

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

N/A

# Actions to be taken

* None

# Relevant information from outside CEPT

## European Union (February 2015)

Extract of the RSPG Opinion on Common Policy Objectives for WRC-15

“WRC-15 Agenda Item 1.8 provides for a review of the regulatory arrangements introduced at WRC-03 for Earth Stations on Vessels (ESVs) which operate in fixed-satellite service networks in the uplink bands 5 925 – 6 425 MHz and 14 – 14.5 GHz. The objective of the review is to relax certain requirements following successful implementation of the original regulations.

Resolution 902 (WRC-03) contains provisions for the operation of ESVs including technical conditions and limits, with regard to the protection of terrestrial services operating in the same band. Resolution 902 could be reviewed to take into account the outcome of the studies on this Agenda Item with the aim to investigate whether present conditions for the operation of ESVs need to be retained or whether they should be modified. These bands are mainly used for commercial purposes. Revised provisions would support the development and use of ESVs as well as the European space and maritime industries.

Europe should support allowing more flexibility to ESV operation but continuing to protect other services in the same bands (5 925 – 6 425 MHz and 14 – 14.5 GHz).

(…)

Elements for a common policy objective:

(…)

Under Agenda Item 1.8, Member States should support allowing more flexibility to ESV operation while continuing to protect other services in the same bands (5 925 – 6 425 MHz and 14 – 14.5 GHz).”

## Regional telecommunication organisations

APT (July 2015)

APT Members support no change to the Radio Regulations, Resolution 902(WRC-03) and the suppression of the Resolution 909 (WRC-12)

ATU (July 2015)

Supports support no change to the Radio Regulations.

Arab Group (August 2015)

ASMG Position:

* Support NOC to the protection distances in Resolution 902 in order to protect terrestrial services.
* Does not support the use of PFD limits criteria to identify protection distances.
* ACP: NOC

CITEL (December 2014)

There is no IAP on 1.8.

RCC (September 2015)

The RCC Administrations consider that possible modifications to Resolution 902 (WRC-03) with the purpose to reflect existing technologies and technical characteristics of earth stations located on board vessels (ESV) should be made only ensuring protection to the existing radio services and not limiting their further development.

The RCC Administrations consider it reasonable to keep using the protective distance criterion in order to ensure sharing between ESV stations and stations of other services in the frequency bands specified in Resolution 902 (WRC-03).

The RCC Administrations do not object to modify protective distances from ESV to a coast line, subject to ensuring protection of stations in other services having allocations in the frequency bands 5 925-6 425 MHz and 14-14.5 GHz.

The RCC Administrations consider that exact protective distances from a vessel to a coast line shall be determined for different ESVs in the frequency bands 5 925-6 425 MHz and 14-14.5 GHz taking into account the maximum e.i.r.p. spectral density towards the horizon. These distances should be determined according to levels of protection from interference specified in Resolution 902 (WRC-03).

The RCC Administration support Method D of CPM Report.

## International organisations

IATA (date of proposal)

ICAO (date of proposal)

IMO (September 2015)

IMO requests that modifications to Resolution 902 (WRC-2003) will permit ESVs to be operated by the mariner in an uncomplicated, straightforward manner and closer to the shore, in accordance with the outcome of studies to maintain compatibility with other services that may be affected.

NATO (August 2015 )

NATO supports the continuation of studies of possible alternative approaches as a means to allow more flexibility to ESV operation while continuing to protect the other services to which the 5 925-6 425 MHz and 14-14.5 GHz bands are allocated

SFCG (August 2015)

SFCG supports the protection of existing space science service allocations. No revision to the provisions relating to ESVs should be made in 14-14.5 GHz band unless acceptable sharing criteria are developed. SFCG assumes that any change from the existing fixed distances from shore will be verifiable and enforceable.

IUCAF (February 2015)

This AI is subject to more than the usual uncertainty in the basic assumptions needed to do definitive studies. Until these uncertainties are relieved, no changes to the RR should be made.

IUCAF supports Methods A or E that would not change the RR.

## Regional organisations

CRAF (September 2015)

"Five methods have been developed to satisfy this AI, ranging from Method A: NOC to Method E, which proposes to review the regulatory regime governing the operation of ESVs to conform to the principles and objectives of the Radio Regulations.”  The intervening methods either lengthen or shorten various offshore protection distances based on different underlying assumptions and variables.

This AI is subject to more than the usual uncertainty in the basic assumptions needed to do definitive studies. Until these uncertainties are relieved, no changes to the RR should be made.

CRAF approves Methods A or E that would not change the RR

ESA (September 2014)

Supports SFCG positions