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| Subject:  | Draft 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

a) 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;

b) 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.”

# Preliminary 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 ESV 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 new technologies of ESV.

CEPT considers that the exact 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 spectral densities towards horizon, to ensure the protection of the terrestrial services in the frequency bands 5925-6425 MHz and 14-14.5 GHz).

# 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.

While using the new technologies may be possible to reduce minimal ESVs diameters and possible decrease the protective 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.

Detailed technical characteristics of new types of ESVs are resulted in 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”.

This Recommendation presents technical characteristics of two new types of ESVs which are absent in Recommendation ITU-R S.1587-1 (2003), namely System 5 and System 4 in the C and Ku frequency bands accordingly.

Comparison of the basic ESVs characteristics from Recommendation ITU-R SF.1650-1 (technical characteristics of ESVs which have been used for studies under Resolution 902 (WRC-03) and Recommendation ITU-R S.1587-2 (technical characteristics of new ESVs) specifies that transmit e.i.r.p. density in new stations in a C-band approximately on 20 dB below than in the traditional ESVs, and on 12 dB below - in a Ku-band.

Thus, now all the ESVs stations may be divided into two main classes:

* the ESVs with characteristics from Recommendation ITU-R SF.1650-1 (traditional ESVs);
* the new ESVs with characteristics from Recommendation ITU-R S.1587-2 (Systems 5 and 4).

At present WP4A SG4 ITU-R are discussing the “Working document towards a preliminary draft new Report ITU-R S.[ESV] on the interference effect of transmissions from earth stations on board vessels operating in fixed-satellite service networks on terrestrial co-frequency stations”. .

Considering this document the CEPT supports the

combinations of various ‘minimum distances from ESVs according to maximum e.i.r.p spectral densities towards horizon’ taking into account the new ESVs technologies and the increasing number of the ESVs passing.

From 2003 the number of ESVs has been increased. In order to take into account the increasing numbers of the passing vessels, the calculations of the previous study stage are reviewed within WP 4A.

Preliminary results show the reduction of the protection distances for the new stations even for the increasing numbers of the passing vessels.

# 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 srvice 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.

Doc 4A/468, Annex 12 – Working document towards a preliminary draft new Report ITU-R S.[ESV] on the interference effect of transmissions from earth stations on board vessels operating in fixed-satellite service networks on terrestrial co-frequency stations.

Doc 4A/468, Annex 24 – Work plan for WRC-15 Agenda item 1.8.

Doc 4A/468, Annex 25 – Working document - Draft CPM text on WRC-15 Agenda item 1.8.

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 (15/06/2007) – 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

* to prepare proposals to revision of Resolution 902 (WRC-03)
* to prepare proposals to the draft CPM Report
* to prepare proposals to ECP

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

## European Union (date of proposal)

## Regional telecommunication organisations

APT (November 2013)

APT Members are of the view that there should be a review of results from previous ITU-R studies taking into account all relevant prevailing factors that were not considered when the studies were carried out. Such a review should also take into account the protection of the terrestrial services in accordance with the Resolution 909 (WRC-12) to enable administrations to decide on the potential for possible relaxation of the current restrictions applying to ESVs

ATU (date of proposal)

Arab Group (December 2013)

ASMG Position:

«Follow up the current studies. Support NOC to the provisions of Earth Stations located on board Vessels (ESVs) operating in the Uplink bands ( 5925-6428 MHz & 14-14.5 GHz) and keep the current distance. To protect the existing services in these two bands».

CITEL (December 2013)

Preliminary Views of CAN/USA:

«Supports the modification of Resolution 902 (WRC-03) to more accurately reflect the operations of today’s ESVs and to reduce the coordination burden on administrations.

Supports the continuation of studies of possible alternative approaches, including development of pfd values. The pfd values are intended to replace or supplement coordination distances 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».

RCC (November 2013)

«The RCC administrations consider that the 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 (ESV), should be made only at protecting the other services and also should not limit their further development.

The RCC administrations consider that it’s necessary to keep the use of criterion of protective distances with the purpose of regulation of sharing ESV and other terrestrial services in the frequency bands specified in Resolution 902 (WRC-03), thus does not object concerning possible decrease in protective distances in view of modern level of ESV development while protecting the other services having allocations in the frequency bands 5925-6425 MHz and 14-14.5 GHz. Exact values of protective distances from a vessel up to a coast in the C and Ku-bands should be determined at the further studies)».

## International organisations

IATA (date of proposal)

ICAO (date of proposal)

N/A

IMO (November 2013)

Draft IMO position:

«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 (December 2013)

«NATO supports the continuation of studies of possible alternative approaches, including the use of a pfd criterion, 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 (date of proposal)

WMO (date of proposal)

## Regional organisations

ESA (date of proposal)

EUMETNET (date of proposal)

Eurocontrol (date of proposal)