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| **World Radiocommunication Conference (WRC-15)Geneva, 2–27 November 2015** |  |
| **INTERNATIONAL TELECOMMUNICATION UNION** |  |
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| PLENARY MEETING | **Addendum 8 toDocument 35-E** |
|  | **30 September 2015** |
|  | **Original: French** |
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| Cameroon (Republic of) |
| Proposals for the work of the conference |
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| 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)**;

Introduction

The provisions relating to earth stations located on board vessels (ESVs) operated in the bands 5 925‑6 425 MHz (C-band) and 14‑14.5 GHz (Ku-band) as contained in Resolution 902 (WRC-03) must be reviewed to reflect current ESV technologies and technical characteristics that are being used or planned to be used and the increased use of these earth stations located on board vessels while ensuring the continued protection of other services to which these frequency bands are allocated.

These frequency bands are used in most developing countries for medium- and long-distance backhaul for cellular networks, and their use is likely to further grow, and in some cases provide the backbone of infrastructure, made up of terrestrial stations that are near coastlines and point towards the sea, that is required for broadband communications to rural or remote communities or offshore oil platforms.

The circulation of ESVs within limits defined by Resolution 902 (WRC-03) requires appropriate administrative and procedural arrangements between the ESV operators, licensing administrations and potentially affected coastal countries to ensure the protection of fixed service (FS) stations.

Based on the results of the ITU-R studies, we propose that Resolution 902 (WRC-03) be revised to increase the off-shore protection distance in the C-band to 345 km in order to ensure that the fixed service is better protected without any interference, while taking account of the use of old and new operational ESVs simultaneously.

Proposal

It is proposed that Resolution 902 (WRC‑03) be revised and that Resolution 909 (WRC‑12) be suppressed, in order to better manage the use of ESVs, as follows:

MOD CME/35A8/1

RESOLUTION 902 (rev.WRC-15)

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

The World Radiocommunication Conference (Geneva, 2015),

considering

*a)* that there is a demand for global wideband satellite communication services on vessels;

*b)* that the technology exists that enables earth stations on board vessels (ESVs) to use fixed-satellite service (FSS) networks operating in the uplink bands 5 925-6 425 MHz and 14‑14.5 GHz;

*c)* that ESVs are currently operating through FSS networks in the bands 3 700-4 200 MHz, 5 925-6 425 MHz, 10.7-12.75 GHz and 14-14.5 GHz under No. **4.4**;

*d)* that ESVs have the potential to cause unacceptable interference to other services in the bands 5 925-6 425 MHz and 14-14.5 GHz;

*e)* that, with respect to the bands considered in this Resolution, global coverage is only available in the band 5 925-6 425 MHz and that only a limited number of geostationary FSS systems can provide such global coverage;

*f)* that, without special regulatory provisions, ESVs could place a heavy coordination burden on some administrations, especially those in developing countries;

*g)* that, in order to ensure the protection and future growth of other services, ESVs need to operate under certain technical and operational limitations;

*h)* that, within ITU‑R studies, 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;

*i)* that, in order to limit the interference into other networks in the FSS, it is necessary to establish maximum off-axis e.i.r.p. density limits on ESV emissions;

*j)* that establishing a minimum antenna diameter for ESVs has an impact on the number of ESVs that will ultimately be deployed, hence it will reduce interference into the fixed service,

noting

*a)* that ESVs may be assigned frequencies to operate in FSS networks in the bands 3 700-4 200 MHz, 5 925-6 425 MHz, 10.7-12.75 GHz and 14-14.5 GHz pursuant to No. **4.4** and shall not claim protection from, nor cause interference to, other services having allocations in these bands;

*b)* that the regulatory procedures of Article **9** apply for ESVs operating at specified fixed points,

resolves

that ESVs transmitting in the 5 925-6 425 MHz and 14-14.5 GHz bands shall operate under the regulatory and operational provisions contained in Annex 1 and the technical limitations in Annex 2 of this Resolution,

encourages concerned administrations

to cooperate with administrations which license ESVs while seeking agreement under the above-mentioned provisions, taking into consideration the provisions of Recommendation **37 (WRC‑03)**,

instructs the Secretary-General

to bring this Resolution to the attention of the Secretary-General of the International Maritime Organization (IMO).

ANNEX 1 TO RESOLUTION 902 (rev.WRC-15)

Regulatory and operational provisions for ESVs transmitting in the 5 925‑6 425 MHz and 14-14.5 GHz bands

1 The administration that issues the licence for the use of ESVs in these bands (licensing administration) shall ensure that such stations follow the provisions of this Annex and thus do not present any potential to cause unacceptable interference to the services of other concerned administrations.

2 ESV service providers shall comply with the technical limitations listed in Annex 2 and, when operating within the minimum distances as identified in item 4 below, with the additional limitations agreed by the licensing and other concerned administrations.

3 In the 3 700‑4 200 MHz band and 10.7-12.75 GHz range, ESVs in motion shall not claim protection from transmissions of terrestrial services operating in accordance with the Radio Regulations.

4 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 345 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 Annex 2. Any transmissions from ESVs within the minimum distances shall be subject to the prior agreement of the concerned administration(s).

5 The potentially concerned administrations referred to in the previous item 4 are those where fixed or mobile services are allocated on a primary basis in the Table of Frequency Allocations of the Radio Regulations:

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| --- | --- |
| Frequency bands | Potentially concerned administrations |
| 5 925-6 425 MHz | All three Regions |
| 14-14.25 GHz | Countries listed in No. **5.505**, except those listed in No. **5.506B** |
| 14.25-14.3 GHz | Countries listed in Nos. **5.505** and **5.508**, except those listed in No. **5.506B** |
| 14.3-14.4 GHz | Regions 1 and 3, except countries listed in No. **5.506B** |
| 14.4-14.5 GHz | All three Regions, except countries listed in No. **5.506B** |

6 The ESV system shall include means of identification and mechanisms to immediately cease emissions, whenever the station does not operate in compliance with the provisions of items 2 and 4 above.

7 Cessation of emissions as referred to in item 6 above shall be implemented in such a way that the corresponding mechanisms cannot be bypassed on board the vessel, except under the provisions of No. **4.9**.

8 ESVs shall be equipped so as to:

– enable the licensing administration under the provisions of Article **18** to verify earth station performance; and

– enable the cessation of ESV emissions immediately upon request by an administration whose services may be affected.

9 Each licence-holder shall provide a point of contact to the administration with which agreements have been reached for the purpose of reporting unacceptable interference caused by the ESV.

10 When ESVs operating beyond the territorial sea but within the minimum distance (as referred to in item 4 above) fail to comply with the terms required by the concerned administration pursuant to items 2 and 4, then that administration may:

– request the ESV to comply with such terms or cease operation immediately; or

– request the licensing administration to require such compliance or immediate cessation of the operation.

ANNEX 2 TO RESOLUTION 902 (rev.WRC‑15)

Technical limitations applicable to ESVs transmitting in the bands 5 925‑6 425 MHz and 14-14.5 GHz

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|  | 5 925-6 425 MHz | 14-14.5 GHz |
| Minimum diameter of ESV antenna | 2.4 m | 1.2 m1 |
| Tracking accuracy of ESV antenna | ±0.2° (peak) | ±0.2° (peak) |
| Maximum ESV e.i.r.p. spectral density toward the horizon | 17 dB(W/MHz) | 12.5 dB(W/MHz) |
| Maximum ESV e.i.r.p. towards the horizon | 20.8 dBW | 16.3 dBW |
| Maximum off-axis e.i.r.p. density2 | See below | See below |
| 1 In any case, the use of smaller antenna size shall be in compliance with the tracking accuracy of ESV antenna, maximum ESV e.i.r.p. spectral density toward the horizon, maximum ESV e.i.r.p. towards the horizon and maximum off-axis e.i.r.p. density limits in the Table above and the protection requirements of the FSS intersystem coordination agreements.2 In any case, the e.i.r.p. off-axis limits shall be compliant with the FSS intersystem coordination agreements that may agree to more stringent off-axis e.i.r.p. levels. |

Off-axis limits

For earth stations on board vessels operating in the 5 925-6 425 MHz band, at any angle φspecified below, off the main-lobe axis of an earth-station antenna, the maximum e.i.r.p. in any direction within 3° of the GSO shall not exceed the following values:

**5 925-6 425 MHz**

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| --- | --- |
| *Angle off-axis* | *Maximum e.i.r.p. per 4 kHz band* |
|  2.5° | ≤ | φ | ≤ |  7° | (32 − 25 log φ) dB(W/4 kHz) |
|  7° | < | φ | ≤ |  9.2° | 11 dB(W/4 kHz) |
|  9.2° | < | φ | ≤ |  48° | (35 − 25 log φ) dB(W/4 kHz) |
|  48° | < | φ | ≤ |  180° | −7  dB(W/4 kHz) |

For ESV operating in the 14-14.5 GHz band, at any angle φ specified below, off the main-lobe axis of an earth station antenna, the maximum e.i.r.p. in any direction within 3° of the GSO shall not exceed the following values:

**14.0-14.5 GHz**

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| *Angle off-axis* | *Maximum e.i.r.p. per 40 kHz band* |
|  2° | ≤ | φ | ≤ |  7° | (33 − 25 log  φ) dB(W/40 kHz) |
|  7° | < | φ | ≤ |  9.2° | 12 dB(W/40 kHz) |
|  9.2° | < | φ | ≤ |  48° | (36 − 25 log φ) dB(W/40 kHz) |
|  48° | < | φ | ≤ |  180° | −6  dB(W/40 kHz) |
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**Reasons:** This modification is intended to better protect terrestrial services vis-à-vis earth stations located on board vessels (ESVs), which is essential for coastal countries like Cameroon.

SUP CME/35A8/2

RESOLUTION 909 (WRC‑12)

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

**Reasons:** Studies on this matter are no longer required.

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