European Satellite Operators Association response:

"(Draft) RSPG Opinion on Common Policy Objectives for WRC -15"

12 January 2015

Introduction

ESOA is pleased to provide comments to the RSPG in response to the public consultation process for the (Draft) RSPG Opinion on Common Policy Objectives for WRC – 15"

ESOA is a non-profit European organisation established with the objective of serving and promoting the common interests of European satellite operators. The Association is the reference point for the European satellite operators industry and today represents the interests of 25 members including satellite operators who deliver information communication services across the globe as well as European space industry stakeholders and insurance brokers.

There are a large number of agenda items for WRC-15 which are of interest to ESOA and the Association together with its Members have been very active all along the WRC preparation cycle at ITU, CEPT and within the EU Members national delegations.

As a general comment, ESOA would like to provide positive feedback to the RSPG on the Draft Opinion and the support that is formulated in favour to new/extended spectrum allocation for the satellite services at the upcoming WRC 15.

The satellite industry is involved in different key policy areas of the Union and we are pleased to see that the role satellites play is generally acknowledged in the positions reflected in the document. The benefits to the European Union which arise from satellite services include those arising from the economic benefits from the European space industry – which in most cases rely on the availability of adequate spectrum - and the benefits to EU citizens and consumers who rely on satellite services. The benefits to EU citizens and consumers may be direct in some cases – for example in the case of satellite Direct-to-Home TV services or rural broadband access, or may be secondary in other cases, for example in the case of satellite for TV contribution links or in the case of satellite feeder links to support safety-of-life communications on ships (e.g. GMDSS) and aircraft and aircraft (e.g. AMS(R)S). All these satellite services serve the Common Policy Objectives of the Union.

We wish to emphasise that the Radio Regulations and the actions taken at ITU World Radiocommunication Conferences are very important for all satellite operators. The provisions

the Radio Regulations related to satellite services are highly relevant to the development of satellite services in the Union and are highly relevant to the European space industry as a whole. In particular, the availability of internationally harmonised allocations to space services is vital to support the development and the deployment of satellite services. Furthermore, it is necessary to ensure that sharing arrangements with other services in the Radio Regulations do not lead to interference to or from satellite services. This means that, in some instances, it is necessary for administrations to refrain from making certain bands available to particular services in order to maintain the global or regional harmonisation of space service allocations.

ESOA notices that RSPG gives strong support to meeting the spectrum requirements for terrestrial mobile broadband. ESOA is concerned that despite giving a high emphasis to meet the demands for terrestrial mobile broadband, the actual spectrum requirements are not adequately scrutinised.

ESOA comments are provided to the main Agenda Items for the WRC 15 that are related to European policy areas having a major impact on the satellite communications industry activities and future development.

Information Society – Electronic Communications

WRC 15 Agenda Item 1.1

ESOA is of the view that RSPG support for IMT worldwide allocation in the 1492-1518 MHz and 3 400-3800 MHz bands, based on the RSPG Broadband Opinion, would lead to interference to satellite services (i.e, 3 400-4 200 MHz, 5 725-5 925 MHz and 5 925-6 425 MHz) and should therefore not be pursued as a candidate bands in view of WRC 15.

Regarding potential use of the band 1492-1518 MHz for IMT, ESOA is concerned with the potential for interference to MSS services which operate in the adjacent band, 1518-1559 MHz Studies submitted to the ITU JTG 4-5-6-7 and CEPT Project Team D have shown the potential for significant interference to MSS operations. While studies are not yet complete, it is clear that some constraints will be required on IMT operations including a guard band with respect to MSS operations above 1518 MHz. Hence not all of the band 1492-1518 MHz could be identified for IMT. Given the global nature of both IMT operations and MSS operations, a globally harmonised solution to this issue would be required. As a consequence, RSPG should not support IMT identification in any part of 1492-1518 MHz before this interference issue is fully assessed and a global solution is determined.

ESOA has significant concerns with RSPG approach also to the 3400 -3600 and 3600 – 3800 MHz.

Satellites operating these bands are incredibly important to the global communications infrastructure even if they are not used as extensively *within* Europe as in other continents as it is correctly reported in the Draft Opinion.

It is important to mention nevertheless that Europe often provides a "hub" function for C-band connectivity into other continents, be it for services to the general public (e.g. GSM backhaul in Africa), for private companies (VSATs for connectivity in the Oil, Gas or ATM sectors) or for institutions or governments (air navigation services, emergency or UN services).

Identification of the band 3 400-3 800 MHz for IMT worldwide would result in significant risks for satellite operators (the largest of which are European companies), as well as for service providers to continue to use this band for FSS services. Irrespective of whether that band is actually used for IMT, such action would remove regulatory certainty and have an immediate chilling effect on investment and the long-term use of this band by the FSS.

Moreover, spectrum demand for IMT in other regions of the world is far lower than in Europe, especially in developing countries. Therefore, the identification for IMT in these regions should be balanced in function of their specific requirements.

ESOA is also of the view that a worldwide identification would serve *non-European* industrial interests - those of equipment manufacturers who wish to export their products across the world. In addition, the EC Decision 2008/411/EC has not resulted in any great take-up by the terrestrial wireless community within the EU.

ESOA recognises that the EC Decision 2008/411/EC (now amended by EC Decision 2014/276/EU) makes the bands 3400-3600 MHz and 3600-3800 MHz available for terrestrial wireless networks. However the use of these bands by terrestrial systems may proceed under the current provisions of the Radio Regulations, and ESOA does not see any need to revise the current regulations in this regard.

Space Policy

WRC 15 Agenda item 1.6

ESOA is of the opinion that RSPG support to a new primary allocation for the fixed satellite service 1) of 250 MHz between 10 GHz and 17 GHz in Region 1; and 2) of 250 MHz in Region 2 and 300 MHz in Region 3 in the range 13 GHz to 17 GHz is critical for the European satellite operators. Provided existing users are protected, in particular in the harmonised NATO frequency band 14.62 – 15.23 GHz, such allocation will allow to fulfil the high demand of costumers for Ku band spectrum (10 GHz to 17 GHz) and on the other hand, solved the current imbalance between the uplink and downlink that would result in a more efficient use of the spectrum by fixed satellite service.

WRC 15 Agenda item 1.7

ESOA supports retaining the recognition for aeronautical use of the band 5091-5150 MHz by ARNS and AM(R)S, as well as removing limitations (including timing restrictions) on the FSS.

The resolution of this Agenda Item seems to be already the matter of a large consensus: only one method is identified in the draft CPM text, and is retained as the basis for the position of regional

and international organisations, including CEPT and ICAO. ESOA therefore supports joining this consensus.

Agenda item 1.9.1

The agreement found at CEPT level is reflected on the European Common position as well as on the CEPT brief which contains only one method consisting on the allocation of 2×100 MHz to FSS, with some restrictions, to satisfy Agenda Item 1.9.1. This European Common position is the result of numerous detailed technical studies held to ensure the protection of incumbent services.

ESOA is pleased with RSPG view that Member States should support the new primary allocation of 2×100 MHz for the fixed-satellite service in the 7/8 GHz bands.

WRC 15 Agenda Item 1.10

The ESOA position for the 22.55 - 23.55 GHz frequency range is “No Change”. The EDRS systems operating in this band should be protected.

For the other proposed frequency bands ESOA does not identify any requirement.

In addition, particular attention will be paid to the protection of actual space services:

- FSS uplinks in the 24.65-25.25 GHz band, and
- EDRS in the 22.55-23.55 GHz & the 25.5-27 GHz frequency bands.

WRC 15 Agenda Item 1.8

The current regulatory provisions applicable to ESVs contain technical requirements to be met by ESVs, such as minimum antenna diameter and maximum power/power density levels in the C and Ku bands. They also require coordination with administrations of countries if ESV operations are to occur within certain distances from the coast, derived based on the maximum regulatory power/power density levels, regardless of the actual power/power density levels transmitted by the ESVs. The technology used by ESVs has advanced considerably, including the use of spread-spectrum modulation (e.g. CDMA) and other techniques which may improve compatibility with terrestrial co-frequency services. The current technology used for ESVs is such that more and more terminals transmit less power/power density levels than those used in the establishment of the current regulatory regime, with a resulting increase in unnecessary coordination. Reducing the protection distances for ESVs transmitting lower power/power density levels would therefore reduce unnecessary administrative burden both for the FSS operators and for administrations protecting terrestrial services.

Two methods to respond to WRC-15 A.I. 1.8 currently in the draft CPM report derive protection distances associated with different values of maximum ESV transmitted power/power density levels that would ensure adequate protection to terrestrial services while achieving the goal of reducing unnecessary coordination. ESOA also notes that one of the main concerns expressed by some administrations, namely that the scenario envisaged by WRC-03 regarding the number of vessels passing through coastal areas underestimates today’s reality, seems to be unwarranted given recent

statistics on vessels in the English Channel, that actually show a reduction in traffic. Therefore ESOA is of the view that it is possible to decrease the protective distances from ESVs up to the coast line as proposed in method C of the CPM text and still protect terrestrial services.

With regard to the reduction of the minimum ESVs antenna diameters, ESOA is still investigating this possibility.

Transport Policy

WRC 15 Agenda Item 1.5

Several ESOA members operate FSS networks in the Ku-band and Ka-band frequencies and are interested in providing services to support future developments for Unmanned Aircraft (UA) systems. Some UA systems are currently making use of FSS networks for control of UA beyond line of sight and for transmission of payload data from UA to ground. Agenda item 1.5 is focussed on provisions to allow for operation of UA in *non-segregated* airspace, and for such use it is clear that safety considerations are of paramount importance.

At the current time, the specific performance requirements for UA systems when operating in non-segregated airspace are not developed by the aviation authorities. However ESOA members have been contributing to the technical studies within the ITU-R to assess the performance of UAS systems that should be expected when operating in the Ku-band and Ka-band FSS bands.

There are different views among ESOA members as to whether changes to the RR should be made by WRC-15 in response to this agenda item. If changes are made, ESOA is of the view that the following should apply:

1. There should be no AMS(R)S allocation.
2. There should be no specific spectrum segments or sub-bands identified for UAS CNPC links within the current FSS allocations.
3. If UAS CNPC links are permitted in the FSS bands, they should receive no higher status or higher protection than other FSS applications.

Elements for a common policy objective

WRC 15 Agenda Item 1.17

ESOA supports the RSPG common policy objective. One minor item, but relevant for operational purposes when operating WAICs in the band 4.2-4.4 GHz and simultaneously FSS earth stations located in the airports areas operating in the 3.4-4.2 GHz, is the need of noting that the operation of WAIC applications in the surrounding of airports where FSS earth stations are installed should be acknowledged in the corresponding resolutions regarding AI 1.17 aiming at alerting the airport authorities and installers of FSS earth stations on the potential restrictions for close geographical operation of FSS and WAICs (adjacent band interference), which would require separation distances higher than 50 to 100 meters typically.

WRC 15 Agenda Item 10

The debate around the proposals for the agenda items for the future WRC 19 is already occupying the regulatory arena. ESOA believes that it is very premature to consider a new agenda item for WRC 19 related to IMT above 6 GHz considering the following:

a) there is no adequate justification for IMT spectrum requirement above 6 GHz;
b) many of the frequency bands currently identified for IMT terrestrial below 3 GHz are not used or not used efficiently;
c) there are many major technical challenges to the use of such high frequency bands above 6 GHz for terrestrial mobile systems;

IMT systems are a subset of the larger class of mobile broadband systems – not all mobile broadband systems meet the IMT requirements – and therefore the criteria for determining technical feasibility for IMT is far more extensive than that for generic mobile systems, for example, one of these is the level of mobility that can be supported (pedestrian speed? vehicular speeds? etc...) in bands above 6 GHz. All these elements need to be considered before a technology can even be considered technically feasible from a physical perspective. And this is without counting the radio aspects of IMT systems (i.e. interface standards) which need to meet the requirements found in various ITU Recommendations and Reports. For example, the current IMT radio interfaces have been extensively evaluated and shown to achieve these IMT objectives and requirements for IMT terrestrial in bands below 3 GHz. Therefore to which extent can these IMT radio interfaces be implemented in bands above 6 GHz?

The latter point above means that sharing studies that would likely be required for a WRC-18/19 agenda item could not be meaningful, as there can be no confidence in the technical and deployment characteristics of the IMT systems.

Furthermore satellite networks also share with each other, in each satellite band in operation today much of the same spectrum is used, employing precise orbital spacing, coordination and directional antennas to avoid interference into each other. IMT services fundamentally break these carefully calibrated sharing assumptions and thus are not compatible with the existing intensive use of spectrum above 6 GHz.

Therefore , ESOA would like to emphasise that:

a. The frequency bands above 6 GHz and below 31 GHz are well used by a large number of services, including satellite communication systems, mostly operating in the C-band, Ku-band and Ka-band frequencies.

b. Many satellite system operators around the world currently operate/ plan to operate global or regional satellite services using specially Ku and Ka band frequencies. These satellite networks do and will provide valuable services in Europe and in many regions around the world and are also enablers for terrestrial operators. For example, Arabsat, Avanti, DirectTV, Echostar, Eshailsat, Eutelsat, Gascom, Hispasat, Inmarsat, Intelsat, Nilesat, Nigcomsat, O3B, RSCC, SES, Telenor, Telesat, Thaicom, Turksat, Viasat, Yahsat, Brazil government, Australian

government, French government, Indian government, China government, etc etc,) all operate or will operate in the near future Ka-band satellite systems within the 27.5 – 30.0 / 17.7 – 20.2 GH bands. This is clearly evident by the level of Ka-band satellite investment and deployment worldwide as shown in the table 1 below.

c. Additionally, satellites are often the enablers for other broadband access technologies and billions of investment has already been spent on the satellite networks. In Europe the space sector has been growing at about 7% each year throughout the recession. Much of that growth will be in Ka-band.

d. If existing allocated ITU FSS/ MSS Ku-band or Ka-band frequencies were to be placed within the scope of any new WRC agenda item, that would create uncertainty for FSS operators, their customers and their investors and no doubt completely jeopardise and disrupt US$ billions worth of investment already made by satellite operator companies worldwide. FSS systems may take 20 years from initial planning and funding, through to their end of life and during this period, regulatory certainty is required. Such regulatory certainty would be undermined by such a new WRC-2018 agenda item proposing to accommodate terrestrial IMT above 6 GHz.

e. ESOA does not see any needto actively support any new agenda item for IMT above 6 GHz. Taking a driving role could effectively commit into supporting the identification of spectrum above 6 GHz for IMT at a time when there is a lot of uncertainty about the need for and feasibility of such identification for IMT.

Above all this, the actual need for additional spectrum to support terrestrial mobile services is far lower than has been predicted by the wireless industry and reported within the ITU.

ESOA recommends that until there are vetted IMT radio interfaces and specific/mature/widely accepted IMT systems characteristics in bands above 6 GHz that can be used in sharing studies to assess compatibility, there should not be a new agenda item related to 5G above 6 GHz. If there is properly validated requirement for additional spectrum for terrestrial IMT above 6 GHz, and the technical feasibility for such IMT systems is mature and has been fully vetted and demonstrated. Any consideration on candidate frequency bands for IMT terrestrial should be limited in scope to frequency bands above 31 GHz and outside the frequency bands allocated by the ITU on a primary or co-primary basis to satellite services. This is a win-win scenario for identifying bands for 5G / IMT above 31 GHz as is also reflected in the EU METIS studies, where the assessment focused on finding wide bands of contiguous spectrum (up to 1 GHz and even above)[1]. Such bands are difficult to find in lower frequencies due to current regulation and already existing and planned usage and associated investments. Only then would a WRC- Agenda Item be more possible to accept and lead to a viable and sustainable growth outcome for all stakeholders both the terrestrial IMT community and the satellite community - in order to ensure that proper weight and priority to supporting both industries is continued and to avoid harmful effects to current and future huge satellite investments in Ka-band worldwide. …

[1] METIS_D5.3_v1, Section 2.5 (Document Number: ICT-317669-METIS/D5.3, dated 29-August-2014)

If ever there was a time to be bold with industrial strategy it is now, so that this growth trend can continue without creating spectrum conflicts between current and future innovative space services and future 5G terrestrial services, given the emerging role for both sectors in many aspects of the low-carbon agenda as well as in media and communications.

Table 1: Level of Ka-band Investment Worldwide

>60 Ka-band GEO Satellites Launched / Procured + Several Non-GEO systems[2]					
Launched systems				To be launched systems	
Satellite Operator	**Satellite**	**Satellite Operator**	**Satellite**	**Satellite Operator**	**Satellite**
Athena	Fidus	Iridium	Iridium (LEO)	Arabsat	Arabsat 6A
Arabsat	Arabsat 5C	JAXA/ NICT	Winds	Arabsat	Arabsat 6B
Arabsat	Badar 5	Nilesat	Nilesat 201	Avanti	HYLAS-3
ABS	ABS-7	Nigerian	NigComSat	Avanti	HYLAS-4
ABS	ABS2	SES	ASTRA 1H	China	ChinaSat 16
Avanti	HYLAS-1	SES	ASTRA 4A	Brazil - Embratel	Star One D1
Avanti	HYLAS-2	SES	AMC-15	Brazil Government	SGDC
Eutelsat	W3C/ 16A	SES	AMC-16	Europasat / Hellas-Sat 3	Europasat / Hellas-Sat 3
Eutelsat	3D/ 7B	SES	NSS-6	Hispasat	Hispasat AG1
Eutelsat	Hotbird 6	SES	ASTRA-1L	Hispasat	Amazonas 5
Eutelsat	EUTELSAT-3B	SES	Astra 2E	Hughes	EchoStar 19
Eutelsat	Ka-Sat	SES	ASTRA 2F	Inmarsat	Global Xpress F2, F3
O3b Limited	O3b (MEO)	SES	ASTRA-3B	Intelsat	Epic – 29e
RSCC	Express AT2	SES	ASTRA 4B	India-ISRO	G-Sat X
RSCC	Express AM4 4R	SES	ASTRA 5B	ictQATAR	ES'HAIL 2
RSCC	Express AM5	SES	Sirius 4	NBN Co	NBN-1A
RSCC	Express AM6	SpaceCom	Amos 3	NBN Co	NBN-1B
Hispasat	Spainsat	SpaceCom	Amos 4	O3b Limited	O3b (MEO)
Hispasat	Amazonas-3	Telesat	Anik F2	SES	ASTRA 2G
Hispasat	Hispasat-1E	Telesat	Anik F3	Spacecom	Amos 6
ictQATAR	ES'HAIL	Telesat	Nimiq 4	Telenor	Thor-7
Hughes	Spaceway-3	Turksat	Turksat 4A	Turksat	Turksat 4B
Hughes	EchoStar 17	ViaSat	ViaSat-1	Turksat	Turksat 5A
ISRO	G-Sat 14	ViaSat	Wildblue -1	ViaSat	ViaSat -2
Inmarsat	Inmarsat-5 F1	ViaSat	Anik-F2	Yahsat	Al Yah 3
Inmarsat	Alphasat 1-XL	Yahsat	Yahsat 1A		
Intelsat	IAS-28	Yahsat	Yahsat 1B		

[2] By 2020 there will be a significantly increased number of Ka-band GEO and Non-GEO systems deployed and procured by many countries/ operators worldwide.
The data in Table 1 have been compiled from public information and from satellite operator websites, third party consultant reports and analyst reports; it is not intended to be an exhaustive list. It is, however, indicative of the extensive investments which have been made in developing Ka band satellite systems to date and the further substantial investments already committed or planned for new Ka band satellite systems.

Ipstar	Ipstar/ Measat 5