Roberto Viola @ IFRI conference: Orbital slots and spectrum Use in an Era of Interference

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Keynote speech on:

Interference and telecommunication services

General

The title of today's conference refers to an "Era of interference". Avoiding interference has always been at the heart of spectrum management. Since the beginning ITU has taken on the important role of avoiding interference through coordination.

In today's world of technical progress, political changes and ever increasing demand for spectrum, we must contribute as much as we can at all levels (National, European, International) to the coordinated use of spectrum, in order to avoid interference.

Good coordination (harmonised conditions) at EU level is a win-win for everyone - also in spectrum management. We should also reflect on this aim in the context of satellite communications and avoiding interference.

Interference avoidance is at the centre of EU legislation and action

This principle is notably stipulated in the regulatory Framework for electronic communications[1]and in the Radio Spectrum Policy Programme (RSPP)[2].

[1]Notably: the "Framework Directive" 2002/21/EC on a common regulatory framework for electronic communications networks and services, and; the "Authorisation Directive" (2002/20/EC) of the E.P. and of the Council on the authorisation of electronic communications networks and services.

[2]The Radio Spectrum Policy Programme (RSPP) (Dec 243/2012/EU).

Furthermore, the Radio Spectrum Decision[3] ensures that EU Decisions cover the avoidance of interference. In particular, it makes use of the Radio Spectrum Committee (RSC) and the mechanism of issuing Mandates to CEPT (for ensuring technical coexistence).

We also have the Audiovisual Media Services Directive (AVMSD)[4], which protects the freedom of expression of audiovisual media inside the Internal Market as part of the freedom to provide services, including the freedom to receive and retransmit audiovisual media services.

However, broadcasts intended for reception outside EU and which cannot be received inside the Union using standard consumer equipment, do not fall under the jurisdiction of any Member State and are not covered by the AVMSD.

Having said that, the case of satellite jamming in third parties does of course raise concern. The Commission has expressed this concern in the past and we will continue to hold this position on illegal jamming, i.e. intentional interference.

A case study of how the Commission has addressed interference (C-Band) in a forward-looking manner

This morning, you also discussed the **C-band**. Considering the high demand for terrestrial wireless BB as well as the limited use for satellite applications of the lower C-band (3.4-3.8 GHz) in the EU, the Commission adopted a Decision in 2008 which harmonises the band for wireless broadbandand protects existing satellite use in the band.

[3]Decision No 676/2002/EC of the European Parliament and of the Council of 7 March 2002 on a regulatory framework for radio spectrum policy in the European Community (Radio Spectrum Decision.

[4]Directive 2010/13/EU of the European Parliament and of the Council of 10 March 2010 on the coordination of certain provisions laid down by law, regulation or administrative action in Member States concerning the provision of audiovisual media services (Audiovisual Media Services Directive).

In March 2012 the European Commission issued a Mandate to CEPT to review and amend the technical conditions for the harmonised use of this band in order to adapt them to the latest developments in technology, including the introduction of harmonised frequency (channelling) arrangements. This work on wireless broadband was again to ensure full protection of existing satellite services.

Consequently, the Commission Decision 2008/411/EC on *the harmonisation of the 3 400-3 800 MHz frequency band for terrestrial systems capable of providing electronic communications services in the Community* was modified throughthe Implementing Decision 2014/276/EU of 2 May 2014.

This Decision brings a number on improvements. For example it:

- Introduces technical conditions to facilitate high-speed broadband technologies such as LTE(-A);
- Includes a preferred **TDD channelling arrangement** (mandatory above 3600 MHz);
- assures sharing with C-Band Satellites (3.6-3.8 GHz) on a protected basis;
- uses geographical exclusion zones for satellite Earth Stations;
- foresees a **coordination procedure** between satellite and mobile operators;
- supports the use of small cells for ease of coordination;

Let me stress, that the coordination procedure was developed by satellite operators in cooperation with mobile operators and presented to the Commission and the Member States in the RSC in 2010.

Furthermore, the preferred TDD[5] channelling plan can achieve a more efficient use of spectrum (than FDD[6]) because channels used by satellite Earth stations

[5] Time-Division Duplexing

will affect only specific TDD blocks and not an uplink and a downlink block (as would be the case in FDD).

In short, the updated Commission Decision makes more efficient use of spectrum and gives legal certainty to the sharing of spectrum between terrestrial and satellite services.

But, what about the rest of the C-Band (3.8-4.2 GHz)?

The so-called C-Band (3600-4200 MHz) is used for satellite communications in Europe. Decision 2008/411/EC[7] harmonised the 3400-3800 MHz band for terrestrial systems but its use for wireless broadband is currently low. As outlined in the Commission's report to EP and Council on the spectrum inventory that was issued on 1 September 2014[8]the probable use for small cells makes capacity constraints for wireless broadband in this range unlikely. On the other hand, the analysis concluded that the increase in satellite bandwidth required for backhaul and trunking services, professional services, and the continuously increasing bit rates used for video distribution will be the main trends pushing satellite spectrum demand upwards and that most of those needs may be met by the C-band. This is a valuable band for satellite use as it contains quite a large amount of spectrum at relatively low frequencies which have superior propagation characteristics (allowing very wide coverage) and are less susceptible to rainfall and humidity (enabling signal resiliency) than higher satellite frequencies. There are over 180 satellites providing C-band services and

[6] Frequency-Division Duplexing

[7]Commission Decision of 21 May 2008 on the harmonisation of the 3 400-3 800 MHz frequency band for terrestrial systems capable of providing electronic communications services in the Community.

[8]Report from the Commission to the European Parliament and the Council on the Radio Spectrum Inventory.COM(2014) 536 final

at least 50 of these cover Europe, where this band is used mainly by professional services, due to the high cost associated with the equipment required to operate in such a band. There are around 1400 ground sites in the EU communicating bi-directionally with C-band satellites.

In light of the above, the Commission considers that demands to allow terrestrial wireless broadband services in the whole C-Band (i.e. in 3.8-4.2 GHz as well as 3.4-3.8 GHz) would not be justified. In order to safeguard growth of satellite services in the C-Band and to support the densification of use by satellite in the 3.8-4.2 GHz band the Commission intends to propose studies that could lead to a harmonisation measure for satellite broadband/VSATs[9] in the 3.8-4.2 GHz band.

Preserving Earth Exploration Satellite Services (EESS) in the 5350-5470 MHz band

Considering the growing popularity of RLAN (Wi-Fi) and in order to secure sufficient spectrum for long term growth, in September 2013 the Commission gave a mandate to CEPT to study and identify harmonised compatibility and sharing conditions for a sustainable and efficient use on a shared basis of the frequency bands 5350-5470 MHz and 5725-5925 MHz ('WAS/RLAN extension bands') for wireless access systems including radio local area networks (WAS/RLANs). In the mandate, the Commission made clear that certain incumbent priority applications using those same bands deserve full protection from RLAN interferences. The European Commission EESS service Copernicus[10], which operates in the 5350-5470 MHz bandbenefits therefore of such safeguard measures. Until now, CEPT studies show no progress in the

[9] Very Small Aperture Terminals

[10] Formerly known as GMES.

possibility for RLAN coexistence with Copernicus based on existing mitigation techniques as confirmed by ITU work on this topic. In such a framework the European Commission Joint Research Centre based in Ispra (Italy), is conducting actual technical measurements on this topic and also making factual inputs into CEPT and ITU. They are continuing their measurements, including plans to do testing involving the already launched Sentinel 1 in cooperation with ESA.The CEPT work is not finished yet.Studies on new mitigation techniques will continue as the final deliverable in response to the Mandate is expected only after WRC-15.

WRC-15

We are of course aware that many countries, especially those in tropical regions, depend on the C-bandmuch more heavily than we do in Europe or the US for example. Globally, we should thus be looking for a situation that allows terrestrial and satellite services to develop.

Therefore we would encourage global harmonisation of lower C-Band (3.4-3.8 GHz) for IMT at WRC-15.Also the RSPG, in its draft opinion on WRC-15 priorities, is proposing a global alignment to the maximum extent possible to increase economies of scale for the equipment in this band.

Furthermore, knowing that FSS is extensively deployed in the upper band in many countries, we could imagine safeguards so that the band 3.8 to 4.2 GHz remains the long-term home for satellites on a world-wide basis.At the EU levelwe are open to views on how to best do that.

Conclusion

Avoiding interference is a cornerstone of spectrum management at international, European and national level. It is also at all levels that we must make efforts to

study and develop measures that will deal with harmful interference. Innovation and increasing spectrum demand will further push regulators and operators to use spectrum more efficiently, in particular by taking advantage of sharing possibilities. This will affect all sectors.

Change may bring challenges in terms of dealing with interference, but I believe good coordination, legal certainty and innovation will lead us to success.

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