

**German BNetzA Consultation**  
**Decision to introduction of flexible spectrum rights in the 450 MHz,**  
**900 MHz 1800 MHz & 3.5 GHz bands**  
**SAP REG & ESOA Comments - 22 July 2009**

The satellite community in Europe is concerned about BNetzA's plans to introduce flexibility in the 3.5 GHz band and, as a consequence, to open the C Band 3400-3600 MHz to BWA systems that are mobile. Over C-Band, our sector has designed and is developing future communications systems. In particular and as described in more detail below, satellite service providers are using the C-Band for global communications within Europe and to interconnect with countries outside Europe. SAP REG & ESOA fear that the introduction of high-density, high-powered BWA systems in this band will endanger the future growth of satellite due to the incompatibility between the two types of systems recently verified in a measuring campaign in Germany (Leeheim and Fuchsstadt).

### **Introduction**

Satellite operations in Europe in the 3400-4200 MHz frequency band (C-Band) support a wide range of critical applications including: distance learning, telemedicine and universal access; backhaul (telephony, Internet); very small aperture terminal ("VSAT") data links (e.g. for such purposes as bank transactions or corporate networks); distribution of television programs; feeder links for mobile satellite systems; and emergency links and safety-of-life communications, disaster recovery services and meteorological tracking. Additionally, these frequencies are used for critical data communication links of the European Galileo system connecting remote stations to the Galileo Control Centers in Europe.

The typically large coverage area of C-Band satellites enables very broad geographical and intercontinental connectivity, particularly with countries of tropical latitudes. As a result, C-Band is particularly well suited to address the connectivity needs of all of Europe and provides intercontinental links with Near Middle East, Arab States, Africa, North and South America or parts of Asia. The extensive geographical coverage and numerous service capabilities are possible because C-Band frequencies are particularly robust spectrum (ensuring high link availabilities under commercially viable conditions). In particular, the C-Band frequencies provide better protection from rain attenuation than higher frequencies.

C-band is equally used for feeder links for mobile satellite services ("MSS"), which deliver critical communications for first responders in emergency situations as well as safety of life at sea communications.

Planned satellite C-Band investments and launches in Europe today include:

- SES Newskies NSS-12 in 2009 with 40 transponders in the 3625-4200 MHz band
- SES Newskies NSS-14 in 2010 with 52 transponders in the 3625-4200 MHz band
- SES Sirius 5 in 2011 with 24 transponders in the 3640-4200 MHz band
- Inmarsat Alphasat in 2012 with 6 transponders in the 3550-3700 MHz band
- Intelsat IS-14 in Q4 2009 with 48 C-band transponders in the 3700-4200 MHz band
- Intelsat IS-17 in 2011 with 28 C-band transponders in the 3625-4200 MHz band
- Intelsat IS-20 in 2012 with 24 C-band transponders in the 3700-4200 MHz band
- Intelsat IS-21 in 2013 with 24 C-band transponders in the 3700-4200 MHz band
- Intelsat IS-22 in 2012 with 48 C-band transponders in the 3625-4200 MHz band
- Intelsat IS-23 in 2012 with 40 C-band transponders in the 3700-4200 MHz band
- Intelsat New Dawn in 2011 with 28 C-band transponders in the 3625-4200 MHz band

**NSS-12:** the launch is planned for the second half of 2009. NSS-12 will have 40 3625-4200 MHz transponders. NSS-12 will provide intercontinental links between all continents. It's a high-capacity, high-power spacecraft and its coverage will reach an estimated 2/3 of the world's population.

**NSS-14,** whose launch is foreseen in 2010, will enhance what is already the largest neighborhood in the Atlantic. With 52 transponders in the 3625-4200 MHz band, its high power C-Band coverage and incremental global capacity will be ideal for video distribution, government and VSAT services.

**Sirius 5:** launch is planned for 2011 and will have 24 3640-4200 MHz transponders. Sirius 5 will be used to provide connectivity between Africa and Central / Eastern Europe.

**Alphasat:** launch is planned for 2012. Alphasat is a project of the European Space Agency. The satellite will have the equivalent of 6 C-Band transponders, providing feeder downlinks (for gateway satellite earth stations) in the 3550-3700 MHz band. The satellite will be operated by Inmarsat as a part of its global MSS network, with gateway earth stations located in Europe and elsewhere.

In addition, **Eutelsat W2A** was launched recently (April 2009) with 10 transponders (20 equivalent 36 MHz transponders) in the 3625-4200 MHz band providing pan-African coverage for broadband and telecommunications services as well as connectivity between Europe & Africa.

**AtlanticBird-3** also from Eutelsat, currently in operation at 5°W, includes 10 C band transponders (14 equivalent 36 MHz transponders), is operating in the band 3625-4200 MHz covering in particular Europe and Africa.

Finally, **Intelsat** is currently operating 22 satellites that cover Europe in C-band and is planning to invest over the next four years in 7 more satellites (listed above) that will be able to offer services in C-band to Europe. These satellites will be able to provide communication to and from Europe, Africa, North and South America, Asia and Australia. Most of these existing and planned satellites are currently or will in the future be served from Intelsat's Teleport in Fuchsstadt (Germany).

It is also to be noted that C-Band 3600-4200 MHz will be used for the **Galileo data network** to be operational as of 2013. C-Band has been determined as crucial for Galileo both for its global coverage, link availability & high interference-free reliability. The service to be provided by Galileo will have very stringent requirements on network availability, continuity and latency since it is envisaged that it will be used in safety critical situations for the aviation industry.

### **The Difficulty of Sharing & the Risks of Interference**

The co-allocation of C-Band frequencies between satellite and terrestrial services can be highly detrimental to fixed satellite services (“FSS”). The risks of interference into satellite services are such that protection zones of tens to hundreds of kilometers must be defined around existing satellite earth stations, as established by CEPT & ITU reports and studies and confirmed by field measurements. Notably, the deployment of high capacity / high density terrestrial systems in this band would be severely disruptive of any satellite use of the 3400 – 4200 MHz frequency band. Liberalisation of this band would thus lead to reduced technology and service neutrality.

Even in the absence of a liberalisation regime in this band, it is very clear that sustainable licensing requirements including protection measures such as power limits or geographical separation areas should be urgently defined and adopted at European level to enable the two services to coexist between 3400 and 3800 MHz.

### **European context**

In their draft decision, BNetzA proposes to modify the existing BWA licences in the 3400-3600 MHz band to allow licencees to deploy mobile services. Currently licencees are limited to deploying only fixed services. SAP REG & ESOA believes it is critical to address the protection of FSS earth stations using spectrum in this band.

As a reference for their consultation at 3.5 GHz, together with the RSPG Opinion on WAPECS ref. RSPG05-102, BNetzA has mentioned the two following European documents of relevance for this frequency band:

- Commission decision 2008/411/EC
- ECC decision ECC/DEC(07)02

EC decision 2008/411/EC has enabled the harmonized introduction of BWA within the EU in the spectrum band 3400-3800 MHz. It describes its goal of harmonisation, “...without prejudice to the protection and continued operation of other existing use in this band, the conditions for the availability and efficient use of the 3 400-3 800 MHz band for terrestrial systems capable of providing electronic communications services.”

In addition, the CEPT decision adopted a year before ECC/DEC(07)02 stating that “for the deployment of BWA (broadband wireless access) networks..., administrations shall take into account the in-band and adjacent band compatibility with other services/systems (e.g. FS, FSS, ENG/OB, etc.) and, as a result, coordination of the BWA CS with existing services/systems may be required in the concerned area.”

Although the satellite community does not welcome these decisions, at the very least, it makes clear the need to coordinate with and to protect the continued deployment of FSS in this band.

As a matter of fact, there is no parameter, criteria or methodology identified in any of these texts that makes clear how BWA can be introduced in 3400-3800 without causing interference onto satellite earth stations.

As a basis for appropriate coordination of BWA CS with FSS earth stations in the band 3605-3689 MHz, it is highly recommended that reference should be made to existing ITU-R recommendations and reports. In particular, recommended interference criteria are given in Recommendations ITU-R S.1432 and SF.1006. The latter recommendation includes a methodology for coordination of fixed service stations with respect to FSS earth stations that could be used for coordination of BWA base stations. As additional material of relevance, ITU-R Report M.2109 and ECC Report 100 include example coordination areas for BWA stations with respect to FSS earth stations.

The satellite industry recommends that coordination areas be established around each earth station which has the potential to suffer interference from BWA systems. The size of the coordination area should be established in consultation with the FSS earth station licensees. Operation of BWA systems within the coordination area should be subject to the agreement of the FSS licensee and the requirement to conduct such coordination should be included in each BWA license.

### **International coordination**

As part of opening the 3.5 GHz band to flexibility and reviewing the licensing of the existing terrestrial operators in this band, we would expect BNetzA to put in place international coordination measures to protect non-German FSS earth stations operating abroad that can be vulnerable to interference from German BWA systems – and other countries should do the same to protect German earth stations from their ground emissions.

For BWA systems in the band 3.4-3.6 GHz, there is a requirement to seek the coordination agreement of neighbouring administrations if the BWA stations would be located within the earth station coordination area. There is also a requirement for mobile BWA systems to meet the pfd limit of RR No. 5.430A at the border. The ITU-R is currently developing a new Recommendation on compliance with the pfd limit, and this could be the relevant reference for the licensee.

## **Conclusion**

SAP REG & ESOA respectfully ask BNetzA to consider the ITU & CEPT abovementioned documents when addressing the need to protect FSS earth stations operating between 3400 and 3800 MHz. A transparent and cooperation procedure should be put in place to fully associate the FSS earth station licensees when licensing new BWA operators.

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