

**Summary report of session on  
"Efficient use of orbit/spectrum by satellite systems"  
(Wroclaw, Poland, 12 June 2008)**

The 19th International Wroclaw Symposium and Exhibition on Electromagnetic Compatibility (11-13 June 2008, Wroclaw, Poland) (<http://www.emc.wroc.pl/>) hosted a one-day session on the "Efficient use of orbit/spectrum by satellite systems" on Thursday, 12 June 2008. The objective of the session was to provide participants with an open forum to discuss spectrum access for the satellite industry, and whether technical progress in frequency sharing would complement or contradict regulatory and economic mechanisms in fostering the efficient use of this international resource. At the invitation of the Chairman of the EMC Symposium 2008, the session was organized by the Space Services Department of the Radiocommunication Bureau (BR/SSD), and chaired by Mr. Yvon Henri, Head of SSD. Ten reports were presented at the session (see Annex with detailed program below) and discussed in depth. The main conclusions of the session are presented below.

Satellite technology offers effective technical and economic solutions for the establishment of state-of-the-art telecommunication networks, providing trunk telephony and data, direct digital radio and TV, and broadband services to fixed and mobile user terminals. Accordingly, the demand for satellite capacity has grown, and with it, the demand for use of the orbit/spectrum resource. As the options for such use are limited by a combination of technical and economic factors, the problem of resource scarcity has arisen, holding back the development of new satellite networks. Noting that the geostationary is used quite extensively by satellites, analysis of the existing international regulations governing the use of the orbit/spectrum resources reveals possible shortcomings that could result in its inefficient use and may cause substantial difficulties for the development of further satellite projects. The existing situation requires measures to be taken urgently in order to improve orbit/spectrum efficiency.

One way to increase efficiency could be to adopt updated technical EMC principles which would foster orbit/spectrum sharing. Possible technical approaches to be further studied include:

- refining of recommended antenna radiation patterns (to increase selectivity);
- increasing of acceptable interference values (e.g. based on more real cases and not systematically upon the most stringent case);
- use of higher frequencies permitting smaller antennas and spot beams;
- use of non-geostationary orbits;
- use of state-of-the-art modulation and error correction coding techniques (decrease of susceptibility to interference);
- use of new interference mitigation or compensation techniques,
- use of cognitive or software-defined radio technology;
- use of homogeneous satellite systems.

The economic impact of all such methods must nevertheless be carefully considered.

Some possible imperfections and weaknesses in the ITU Radio Regulations (RR) were also discussed. In the non-planned services, “paper satellite” issues or more precisely, recorded frequency assignments that are fictitious still exist. Independent information on the real use of the orbit/spectrum and the corresponding information in the ITU database show some divergence because administrations have no incentive to give up underused spectrum/orbital positions or update their satellite network parameters at the MIFR recording stage to reflect planned operations. On the other hand, the incentives are quite strong to reserve (and thus freeze) spectrum regardless of one’s own real future needs, thus denying *de facto* access to new entrants. The existing enforcing mechanisms to ensure that a satellite system is operating in accordance with recorded parameters are based mainly on goodwill. When goodwill costs money, such enforcing mechanisms tend to be disregarded. During the discussions the following suggestions to improve on the current situation were put forward:

- eliminate the six-month regulatory period between the submission of advance publication information (API) and the coordination request, or even suppress the API phase for satellite networks subject to coordination procedures;
- provide satellite operators with enhanced responsibilities and rights in ITU registration procedures;
- maintain in the BR database in addition to Resolution 49 information, updated records of satellite launches and geostationary satellite moves in longitude;
- introduce spectrum fees for satellite filings recorded in the MIFR;
- adopt harmonized regional or worldwide VSAT regulations;
- introduce a satellite monitoring system to assist administrations in resolving interference problems;
- introduce in the Radio Regulations more deterrent enforcement mechanisms and administrative measures particularly against the use of orbit and spectrum that is not in compliance with the Radio Regulations and causes harmful interference to frequency assignments recorded in the MIFR.

The importance of combined services for some satellite operators was noted, taking particular account of Resolution 951 (WRC-07) in respect of terrestrial services. One suggested development in this area could be the definition and application of “universal” sharing criteria to be applied to different frequency bands allocated to satellite services, but service-independent. With such an approach, use of a frequency range would be defined by sharing conditions and permissible technical satellite and terrestrial system parameters, and not by the type of satellite service to be provided.

The criticisms made of the planning approach are very well known and come down to minimal uptake of the Plans. Both the BSS and FSS Plans are mainly used by subregional systems, which gain access to planned service spectrum by availing themselves of procedures initially designed as supplementary provisions. The main reason for the subregional system approach is the national coverage restriction embedded in the principles of Plans, making satellite projects for national allotments economically inefficient. Many share the view that urgent measures should be taken in order to ensure that the planned resources are used efficiently.

During the final roundtable, all participants recognized the added value of such open discussion between representatives of regulators, satellite manufacturers, operators and national/regional/international organizations. It was concluded that such exchanges of views should be pursued and enlarged, in order to promote and encourage the development of proposals for enhancing the efficient use of spectrum/orbit by satellite systems, to be discussed within ITU.

There was consensus that the international regulatory framework for registering satellite networks must be improved, and the improved framework be operative or ready to be operative by WRC-11 if ITU is to maintain its credibility and to become fully relevant to the satellite community.

Yvon Henri  
8 July 2008

**Annex:** Detailed program of the session

**Session ITU 1**  
**Efficient Use of Orbit/Spectrum by Satellite Systems**

**Chairman:** Yvon HENRI, International Telecommunication Union Radiocommunication Bureau, Switzerland

**1.1 - ORBIT/SPECTRUM ALLOCATION PROCEDURES, ITU REGISTRATION MECHANISM**

**Yvon Henri**

Head, Space Service Department Radiocommunication  
Bureau International Telecommunication Union,  
Switzerland

[yvon.henri@itu.int](mailto:yvon.henri@itu.int)

**1.2 - HOW ITU AND THE SATELLITE COMMUNITIES CONTRIBUTE TO EFFICIENT USE OF THE ORBIT/SPECTRUM RESOURCES**

**William Luther**

ASRC Management Services, Office of Spectrum  
Management, Reston, Virginia, USA

[William.luther@asrcms.com](mailto:William.luther@asrcms.com)

**1.3 - EFFICIENT SPECTRUM USAGE, ITU AND SATELLITE SYSTEMS**

**Per Hovstad**

Spectrum Management, Asia Satellite Telecommunications  
Co. Ltd

[phovstad@asiasat.com](mailto:phovstad@asiasat.com)

## Session ITU 2

### 2.1 - REGULATORY HARMONISATION FOR EARTH STATIONS: WHAT IS THE BEST LEVEL?

**Alexandre Vallet**

Head of Spectrum/Orbit Ressources Department, Agence Nationale des Fréquences, France

[vallet@anfr.fr](mailto:vallet@anfr.fr)

### 2.2 - GLOBAL COVERAGE 24HR PER DAY FROM INCLINED CIRCULAR ORBITS

**Henry J. Meyerhoff**

Space Spectrum Coordination Consultants Ltd

[Henry.meyerhoff@ties.itu.int](mailto:Henry.meyerhoff@ties.itu.int)

### 2.3 - EMC BETWEEN BWA AND FSS AT 4 GHz

**Tony Reed**

European Satellite Action Plan Regulatory Group

[tonyreeduk@btconnect.com](mailto:tonyreeduk@btconnect.com)

## Session ITU 3

### 3.1 - EUROPEAN REGULATORY APPROACH TO ORBITAL / SPECTRUM REGISTRATIONS

**Gerald Oberst**

Hogan & Hartson LLP, Brussels, Belgium

[geoberst@hhlaw.com](mailto:geoberst@hhlaw.com)

### 3.2 - MONITORING AND ENFORCING THE ORBITAL SPECTRUM

**Jan Verduijn**

Chairman, ITU-R Working Group 1C Spectrum Research Consultancy, Netherlands

[jan.verduijn@ties.itu.int](mailto:jan.verduijn@ties.itu.int)

### 3.3 - SATELLITE MONITORING IN THE FRAMEWORK OF CEPT COMPATIBILITY STUDIES

**Jean-Philippe Kermaal**

European Radiocommunications Office, Copenhagen, Denmark

[kermool@ero.dk](mailto:kermool@ero.dk)

## Session ITU 4

### 4.1 - ADVANCED METHODS OF SPECTRUM MANAGEMENT FOR SATELLITE SYSTEMS

**Vadim Nozdrin**

Space Service Department, Radiocommunication Bureau, ITU, Geneva, Switzerland

[Vadim.nozdrin@itu.int](mailto:Vadim.nozdrin@itu.int)