

.....  
*ITU-D Regional Development Forum for the Asia Pacific Region:  
"NGN and Broadband, Opportunities and Challenges"  
Yogyakarta, Indonesia, 27-29 July 2009*

## **International and national spectrum regulatory frameworks**

*Colin LANGTRY  
Counsellor, ITU Radiocommunication Bureau (BR)  
E-mail: colin.langtry@itu.int*



.....  
*Committed to connecting the world*

## **ITU overview**

Committed to Connecting the World



**191 Member States  
>700 Sector Members  
and Associates**

**ITU**

Helping the World Communicate

**ITU-T**

Telecommunication  
standardization  
– network and  
service aspects



**ITU-R**

Radiocommunication  
standardization and  
global radio  
spectrum  
management

**ITU-D**

Assisting  
implementation and  
operation of  
telecommunications  
in developing  
countries

.....  
Yogyakarta, Indonesia, 27-29 July 2009

**Radio-frequencies and satellite orbits are increasingly in demand for a large and growing number of radio systems such as mobile phones, digital television, space research, emergency telecommunications, global positioning systems, and environmental monitoring.**

- ✓ **The ITU-R plays a vital role in the global management of radio frequencies and satellite orbits, aiming to ensure rational, equitable, and efficient use of the radio-frequency spectrum by all radio systems.**

Yogyakarta, Indonesia, 27-29 July 2009

## Role of the ITU-R

- **Spectrum management** - Ensure the rational, equitable, efficient and economical use of the radio-frequency spectrum by all radiocommunication services, including satellite services
- **Radiocommunication standardization** - Carry out studies without limit of frequency range, adopting Recommendations (standards) on radiocommunication matters

Yogyakarta, Indonesia, 27-29 July 2009

## Spectrum management

Committed to Connecting the World



- **Radio waves do not recognize political borders**
- **the global nature of the problem requires international cooperation and coordination**
- **All parties: governments, manufacturers, service providers and users want interference-free communications**
- **management of the radio spectrum is a necessity**

Yogyakarta, Indonesia, 27-29 July 2009

## Challenges for spectrum management

Committed to Connecting the World

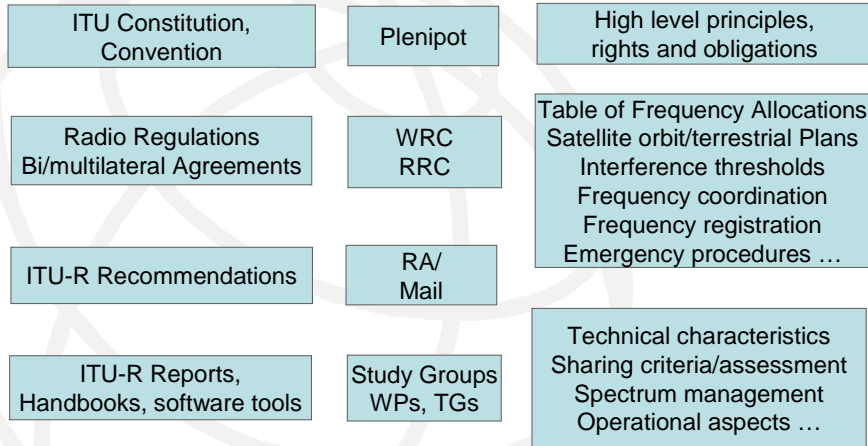


- **Facilitate equitable access and rational use of the limited radio frequency resource**
- **Protect essential services – distress and safety**
- **Prevent/resolve cases of harmful interference**
- **Facilitate effective operation of radio services**
- **Accommodate the ever-increasing demand**
  - More users, new technologies, new applications, higher data rates

Yogyakarta, Indonesia, 27-29 July 2009

## International spectrum management framework

Committed to Connecting the World



Yogyakarta, Indonesia, 27-29 July 2009

## ITU Constitution and the Radio Regulations

Committed to Connecting the World



### CS 195 (PP-02) (RR No. 0.2)

To limit the number of frequencies and the spectrum used to the minimum essential to satisfy the necessary services.

Apply the latest technical advances as soon as possible.

### CS 196 (PP-98) (RR No. 0.3)

Radio frequencies and any associated orbits, including the geostationary-satellite orbit, are **limited natural resources**

**Must be used rationally, efficiently and economically**

### CS 197 (PP-98) (RR No. 0.4)

All stations must be established & operated in such a manner as **not to cause harmful interference to the radio services** or communications of other Member States or of recognized operating agencies, or of other duly authorized operating agencies

Yogyakarta, Indonesia, 27-29 July 2009

## International regulatory framework & National Spectrum Management

Committed to Connecting the World



### ➤ Regulatory framework for national spectrum management:

- Based on international principles to govern the spectrum use and on bi/multi-lateral agreements using ITU instruments (CS, CV, RR, ITU-R Recommendations, etc)
- Need also for regional harmonization and standardization (APT, ASMG, ATU, CEPT, CITELE, RCC)
- Linkage between international and national regulations (allocations, assignments, licensing, monitoring, interference) preserving States' rights and obligations
- Need for national legal framework/regulation to take account of national specificities (geographical, geopolitical, cultural, social, economical, etc)

See [Report ITU-R SM.2093](#)

Yogyakarta, Indonesia, 27-29 July 2009

## National spectrum management

Committed to Connecting the World



### ➤ Key elements of spectrum management:

Spectrum: Engineering – Planning – Economics

- International coordination
- Frequency assignment (table)
- Licensing/authorization
- Frequency registration
- Spectrum monitoring (use/efficiency), inspection & investigation

See [Recommendation ITU-R SM.1047-1](#)

Yogyakarta, Indonesia, 27-29 July 2009




- ✓ Auctions and transferable and flexible spectrum rights appear best-designed to promote and ensure efficient use of spectrum when there are several competing applicants
- ✓ However, auctions may not be appropriate for
  - services in which there is limited competition
  - socially desirable services: safety of life, climate change, etc.
  - for international services such as HF and satellite services
- ✓ For some of these services, fees may be more appropriate. Fees can promote efficient use of the spectrum:
  - not set so low as to be negligible in the eyes of spectrum users, or
  - not set so high as to exceed what a market would set, in which case spectrum will sit idle and generate no benefits.

See [Report ITU-R SM.2012-2](#)

Yogyakarta, Indonesia, 27-29 July 2009

- Frequency spectrum congestion, mainly in urban areas, is prompting **development of new radio technologies (e.g. software defined radio and cognitive radio systems)**
  - ⇒ **technical and regulatory considerations**
- Study of the **impact on radio services** of the increasing use of **short range radio devices (incl. ISM), proliferating across various frequency bands**
- **Growing demands of new applications based on a convergence of radio technologies**, combining elements of different historical radio services
  - ⇒ **need to review and enhance the international regulatory framework**
  - ⇒ **would have also significant impact on national spectrum management**

Yogyakarta, Indonesia, 27-29 July 2009

Visit the ITU-R Sector on Internet Committed to Connecting the World  International Telecommunication Union


at: <http://www.itu.int/ITU-R>

Home | ITU Sectors | Newsroom | Events | Publications | About Us

### Radiocommunication Sector (ITU-R)


The [ITU Radiocommunication Sector \(ITU-R\)](#) plays a vital role in the global management of the radio-frequency spectrum and satellite orbits - limited natural resources which are increasingly in demand from a large and growing number of services such as fixed, mobile, broadcasting, amateur, space research, emergency telecommunications, meteorology, global positioning systems, environmental monitoring and communication services - that ensure safety of life on land, at sea and in the skies. [More...](#)


**Director's corner**




[Biography](#)

**In Focus: Spotlight on ITU-R's key activities**

 [ITU global standard for international mobile telecommunications 'IMT-Advanced'](#)

 [Maritime mobile Access and Retrieval System \(MARS\)](#)

 [Radiocommunications and Climate Change](#)

[Emergency Radiocommunications](#)

[World Radiocommunication Conference 2011 \(WRC-11\)](#)

**Meetings**

08/09 [RRB-08.3](#) (Geneva)  
 24/09 [WP 4B](#) (Geneva)  
 29/09 [WP 4C](#) (Geneva)  
 06/10 [SG Z](#) (Geneva)  
 06/10 [WP 4A](#) (Geneva)

[ITU-R Meetings schedule](#)  
[Meeting sessions](#)

**Newsflashes**

07/07/08 [RRB - Update 1 to the Schedule for consideration of Rules of Procedure](#)

07/06/08 [SCG - ITU Symposium: Modding '2D Television' System begins](#)

**Publications**

**Key Publications**

- [Radio Regulations](#)
- [List VIII - List of](#)

**Activities**

- Conferences and Meetings
- Information
- Publications
- Administrative Circulars and Circulars Letters
- Operational Plans
- Performance Reports

**Databases and Services**

- World Radiocommunication Conferences (WRC)
- Radiocommunication Assemblies (RA)
- Radio Regulations Board (RRB)
- Radiocommunication Advisory Group (RAG)
- Study Groups
- Space Services
- Terrestrial Services
- Sector Organization
- Membership

Reference material Committed to Connecting the World  International Telecommunication Union

- Basic texts of the ITU <http://www.itu.int/publ/S-CONF-PLEN-2007/en>
- Radio Regulations <http://www.itu.int/publ/R-REG-RR-2008/en>
- ITU RRC-06 Final Acts <http://www.itu.int/publ/R-ACT-RRC.14-2006/en>
- Recommendation ITU-R SM.1047-1 <http://www.itu.int/rec/R-REC-SM.1047-1-200107-I/en>
- Report ITU-R SM.2093 <http://www.itu.int/publ/R-REP-SM.2093-2007/en>
- Report ITU-R SM.2012-2 <http://www.itu.int/publ/R-REP-SM.2012-2-2005/en>
- National Spectrum Management Handbook <http://www.itu.int/publ/R-HDB-21/en>
- Spectrum Monitoring Handbook <http://www.itu.int/publ/R-HDB-23/en>
- ITU-R web page <http://www.itu.int/ITU-R>
- Emergency radiocommunications <http://www.itu.int/ITU-R/go/emergency>
- Climate change <http://www.itu.int/ITU-R/go/climate-change>  
<http://www.itu.int/themes/climate/>

Yogyakarta, Indonesia, 27-29 July 2009

***Thank you***

***Colin Langtry***  
Counsellor, ITU-R Study Groups, ITU Radiocommunication Bureau

Yogyakarta, Indonesia, 27-29 July 2009