

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

ITU-R Standardization Activities

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Presentation



- Objectives of ITU-R Study Groups
- Structure of Study Groups
- Radiocommunication Assembly
- Scope of Study Groups
- Current key areas of standardization
- ITU-R Recommendations, Reports and Handbooks

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Role of ITU-R

- ensure the rational, equitable, efficient and economical use of the radio-frequency spectrum by all radiocommunication services, including those using the geostationary-satellite or other satellite orbits,...
- carry out studies without limit of frequency range and adopting Recommendations on radiocommunication matters.

(ref. Article 12 of Constitution)

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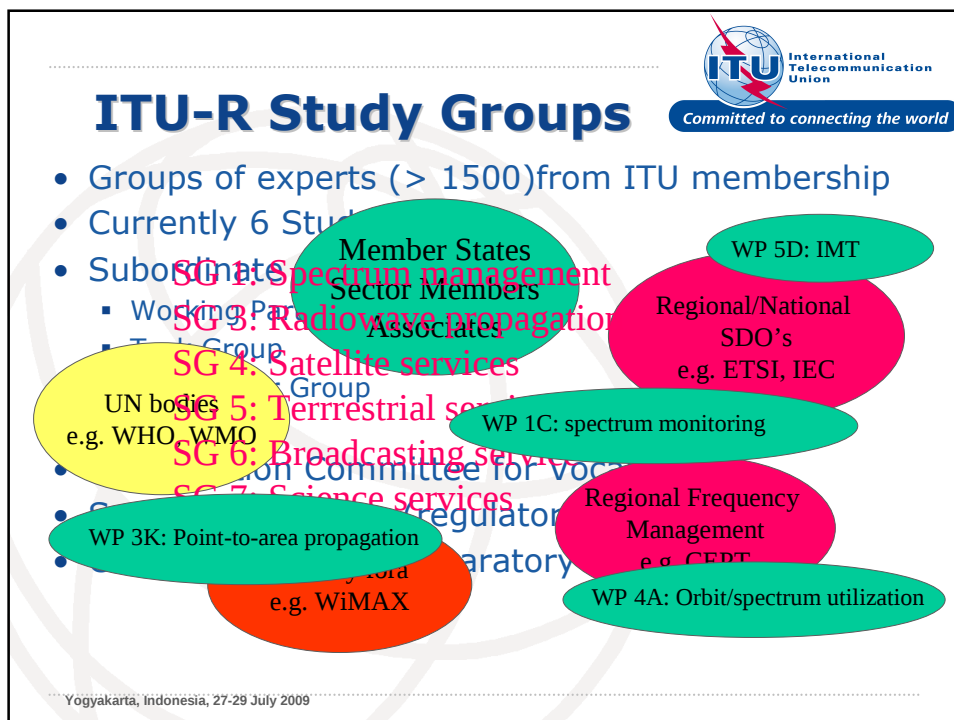
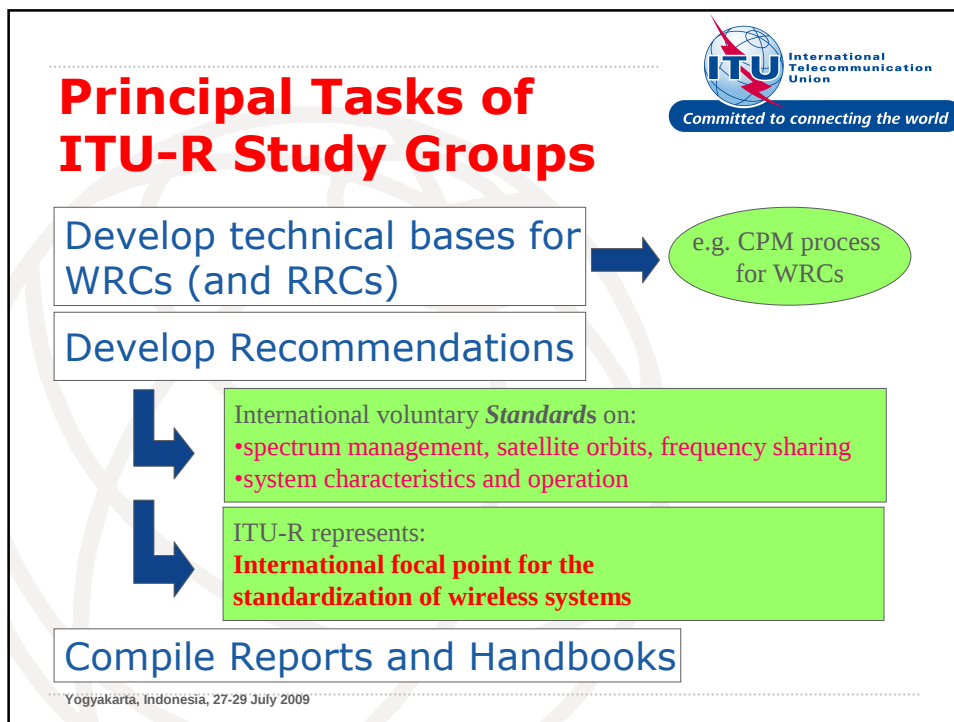
Role of ITU-R

Role conducted through (*inter alia*):

- World (and Regional) Radiocommunication Conferences
- Approval of **Recommendations** by Member States

Technical studies are required which are conducted in **Study Groups**

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ITU-R Study Groups

- **SG 1:** Spectrum management
- **SG 3:** Radiowave propagation
- **SG 4:** Satellite services
- **SG 5:** Terrestrial services
- **SG 6:** Broadcasting service
- **SG 7:** Science services

Supported by Counsellors
and Assistants in Study
Group Department of BR

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Radiocommunication Assembly

- convened every 3-4 years
- associated in time and place with WRCs

(Article 13 of Constitution)

- Adopts Study Group work programmes
- Approves ITU-R Resolutions
 - working procedures
 - specific aspects of Study Group responsibility
- Approves Recommendations
- Establishes ITU-R Study Groups (and elects their chairmen/vice-chairmen)

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Study Group 1 Spectrum management

Principles and techniques for

- spectrum management
- sharing criteria
- spectrum monitoring
- long-term strategies for spectrum utilization

- Short Range radio Devices (SRD)
- International spectrum regulatory framework

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Study Group 3 Radiowave propagation

- Propagation in ionized and non-ionized media
- Development of prediction methods

- Characteristics and mapping of propagation medium
- Propagation prediction methods
e.g. for terrestrial digital broadcasting (RRC-06)

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Study Group 4 Satellite services



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- Systems and performance in FSS, BSS, MSS and RDSS
- Efficient orbit/spectrum utilization for FSS, BSS, MSS and RDSS
- IP Global broadband Internet access via satellite
- Early warning and relief operations

- Technical characteristics for systems and networks in the RNSS
- Satellite radio interface of IMT-2000

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Study Group 5 Terrestrial services



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- IMT-2000 and IMT-Advanced
- Fixed, mobile, portable and nomadic communications, including BWA, RLANs, HAPS
- Maritime and aeronautical services
- Radiodetermination service
- Amateur service
- SDR and CRs

- Next generation mobile access "IMT Advanced"
- Spectrum issues for maritime and aeronautical services

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Study Group 6 Broadcasting service

- Programme production
- Programme assembly
- Delivery
- Reception quality

- Sharing issues at UHF
- Multimedia and data broadcasting for mobile reception

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Study Group 7 Science services

- Systems for space operation, space research, Earth exploration and meteorology
- Radio astronomy
- Standard frequency and time signals

- EESS including meteorological satellite service for disaster prediction and detection, and for climate monitoring
- Protection of passive services, e.g. Radio astronomy

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ITU-R Study Groups on Internet

Home : [ITU-R : Study Groups](#)

Radiocommunication Sector (ITU-R) | [Home](#) | [ITU Sectors](#) | [Newsroom](#) | [Events](#) | [Publications](#) | [About Us](#)

Study Groups

Scope

More than 1 500 specialists, from telecommunication organizations and administrations throughout the world, participate in the work of the Study Groups concerned with:

- ▶ drafting Technical bases for Radiocommunication Conferences
- ▶ developing Draft Recommendations
- ▶ compiling Handbooks

General Information

- ▶ Scope
- ▶ [Study Groups Structure](#)
- ▶ [Brochure](#)
- ▶ [Chairmen and Vice-Chairmen](#)
- ▶ [Chairmen and Vice-Chairmen Meetings](#)
- ▶ [Contacts](#)

Structure

- ▶ [Study Group 1 \(SG 1\) - Spectrum management](#)
- ▶ [Study Group 3 \(SG 3\) - Radiowave propagation](#)
- ▶ [Study Group 4 \(SG 4\) - Satellite services](#)
- ▶ [Study Group 5 \(SG 5\) - Terrestrial Services](#)
- ▶ [Study Group 6 \(SG 6\) - Broadcasting service](#)
- ▶ [Study Group 7 \(SG 7\) - Science services](#)
- ▶ [Coordination Committee for Vocabulary \(CCV\)](#)
- ▶ [Conference Preparatory Meeting \(CPM\)](#)
- ▶ [Special Committee \(SC\)](#)

Disbanded Groups

- ▶ [Study Group 8 \(SG 8\) - Mobile, radiodetermination, amateur and related satellite services](#)
- ▶ [Study Group 9 \(SG 9\) - Fixed service](#)

See: <http://www.itu.int/ITU-R/go/rsg>

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SG Web Page Structure (using SG 4 as a sample)

Study Group 4 (SG 4) - Satellite services

Scope

Systems and networks for the fixed-satellite service, mobile-satellite service, broadcasting-satellite service and radiodetermination-satellite service.

General Information

- ▶ [Brochure](#)
- ▶ [Chairmen and Vice-Chairmen](#)
- ▶ [Counsellor](#)
- ▶ Contributions submission: rsd@itu.int
- ▶ Mailing lists - FTP server [\[link\]](#) - [How to use](#)
- ▶ [ITU-R Electronic facilities](#)

Publications

- ▶ [ITU-R Questions - SG 4](#)
- ▶ [Recommendations - ITU-R BO series](#)
- ▶ [Recommendations - ITU-R S Series](#)
- ▶ [Recommendations - ITU-R SF Series](#)
- ▶ [Recommendations - ITU-R SHG Series](#)
- ▶ [Reports - ITU-R BO Series](#)
- ▶ [Reports - ITU-R M Series](#)
- ▶ [Reports - ITU-R SF Series](#)

Next meeting

- ▶ Tuesday 22/09/09 - Wednesday 23/09/09
- ▶ Place : **Switzerland [Geneva]**
- ▶ Status : **Proposed** - [Add to Calendar](#)
- ▶ Invitation
- ▶ On-line registration
- ▶ [Study Group/Working Party meetings Sharepoint site](#) [New](#)
- ▶ [All meetings](#)
- ▶ [ITU-R Meetings schedule](#) • [Meeting sessions](#) • [Member Information and Package Registration](#)

Structure

- ▶ [Working Party 4A \(WP 4A\) - Efficient orbit/spectrum utilization for FSS and BSS](#)
- ▶ [Working Party 4B \(WP 4B\) - Systems, air interfaces, performance and availability objectives for FSS, BSS and MSS, including IP-based applications and satellite news gathering](#)
- ▶ [Working Party 4C \(WP 4C\) - Efficient orbit/spectrum utilization for MSS and ROSS *](#)

* WP 4C will also deal with the performance issues related to ROSS

Disbanded Groups (in existence during study period 2003-2007)

- ▶ [Working Party 4-9S \(WP 4-9S\) - Frequency sharing between the fixed-satellite service and the fixed service](#)

Documents

- ▶ [Contributions \[link\]](#) [XHTML](#) [PDF](#)
- ▶ [Study Group 4 Summary Record \(Meeting: 16-17/10/08\)](#) [\[link\]](#)
- ▶ [Administrative Documents \(ADM\)](#) [\[link\]](#)
- ▶ [Information Documents \(INFD\)](#) [\[link\]](#)
- ▶ [Temporary Documents \(TD\)](#)
- ▶ [Circular Letters \(L/Cs\)](#) [XHTML](#) [PDF](#)
- ▶ [Administrative Circulars \(CA\)](#) [XHTML](#) [PDF](#)
- ▶ [Administrative Circulars \(CACE\)](#) [XHTML](#) [PDF](#)
- ▶ [Administrative Circulars \(CAS\)](#) [XHTML](#) [PDF](#)
- ▶ [Archives](#)

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Some key areas of ITU-R Standardization

- Broadband wireless access (terrestrial and satellite) – *separate presentation*
- IMT - International Mobile Telecommunications – *separate presentation*
- Broadcasting technologies
- Emergency communications
- Environmental monitoring

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Digital broadcasting

Advantages over analogue systems:

- Expanded services
- Higher quality video and sound
- Lower power consumption
- Greater variety and faster rates of data transmission
- Spectrum efficient – several programmes on one channel

Key achievements in ITU-R:

- GE-06 digital broadcasting plan providing opportunity for “digital dividend” arising from analogue-to-digital switch-over
- HDTV standard (ITU-R BT.709) now 25 years old, being deployed worldwide
- Report ITU-R BT.2140 on transition from analogue to digital terrestrial broadcasting + many ITU-R Recommendations on digital TV, video, audio

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Future Broadcasting Technologies



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Ultra High Definition Television (UHDTV):

- Studies underway to provide better visual experience than HDTV by expanding the field-of-view;
- two image systems being studied: 3 840 x 2 160 and 7 680 x 4 320 pixels;
- complementary multichannel audio system with 22.2 channels.

3D Television:

- new study programme has started: two groups identified;
- first generation systems, near future, plano-stereoscopic display;
- second generation systems, based on object wave recording, long term;
- Workshop was held in April 2009 in Geneva to examine current situation.

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Emergency Communications



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Prediction and Detection: Meteorological services (Met-Aids, Met-Sat); Earth Exploration Satellite Service

Alerting: Amateur service; Broadcasting services (terrestrial and satellite); fixed services (terrestrial and satellite); Mobile services (land, satellite, maritime)

Damage assessment and Relief: Amateur service; Broadcasting services (terrestrial and satellite); fixed services (terrestrial and satellite); Mobile services (land, satellite, maritime); Earth Exploration Satellite Service



Regulatory role



Standardization role

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Emergency Communications



Databases relating to safety of life and rescue operations

- available frequencies for use in emergency situations and guidelines on the management of radiocommunications (Res 647 (WRC-07), Res ITU-R 53)
- Maritime mobile Access and retrieval System (MARS)

Regionally Harmonized Frequency Bands for Public Protection and Disaster Relief

- preferred frequency bands listed in Res 646 (WRC-03)

Study Group activities

- spectrum management guidelines
- Recommendations, Reports, Handbooks providing technical basis for development and operation of the radiocommunication services used in the various phases of emergency and disaster situations

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Climate change



- ITU-R's standardization role on monitoring and mitigating the effects of climate change is very closely linked with that on Emergency Communications
- Through its responsibility for international spectrum management, ITU-R provides interference-free spectrum and satellite orbits for climate monitoring
- Cooperates with UN agencies (e.g. WMO) and international and national organizations involved with climate change

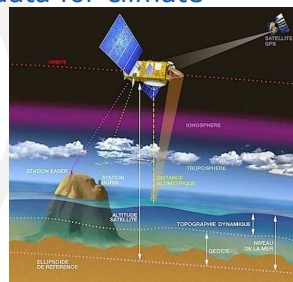


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Climate change



- Study Groups develop Recommendations, Reports and Handbooks on
 - operation of radio systems for environmental monitoring, including climate change; e.g. ITU/WMO Handbook on "Use of Radio spectrum for meteorology: weather, water and climate monitoring and prediction"
 - facilitating the introduction and operation of low-energy systems; e.g. analogue to digital broadcasting
- Satellite-based remote sensors (passive and active) are main tools for obtaining environmental data for climate monitoring
- Systems belonging to
 - Earth exploration satellite service
 - Meteorological-satellite service
 - Meteorological aids service
 form backbone of the
WMO Global Climate Observing System



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Study Group Products



- **Technical bases for WRC (and RRC)**
 - ➡ **CPM Report**
- ITU-R Recommendations
- Reports and Handbooks

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Table of contents of the CPM Report to WRC-11



Chapters of CPM Report

WRC-11 Agenda items

▪ <u>1.</u> Maritime and Aeronautical issues	<u>1.3, 1.4, 1.9, 1.10</u>
▪ <u>2.</u> Radiolocation and Amateur issues	<u>1.14, 1.15, 1.21, 1.23</u>
▪ <u>3.</u> Fixed, Mobile and Broadcasting issues	<u>1.5, 1.8, 1.17, 1.20, 1.22</u>
▪ <u>4.</u> Science issues	<u>1.6, 1.11, 1.12, 1.16, 1.24</u>
▪ <u>5.</u> Satellite issues	<u>1.7, 1.13, 1.18, 1.25, 7</u>
▪ <u>6.</u> Future work programme and other issues	<u>1.2, 1.19, 2, 4, 8.1, 8.2</u>

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Study Group Products



- Technical bases for WRC (and RRC)
➡ CPM Report
- **ITU-R Recommendations**
- Reports and Handbooks

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ITU-R Recommendation Series



- **BO:** Satellite delivery
- **BR:** Recording for production, archival and play-out; film for television
- **BS:** Broadcasting service (sound)
- **BT:** Broadcasting service (television)
- **F:** Fixed service
- **M:** Mobile, radiodetermination, amateur and related satellite services
- **P:** Radiowave propagation
- **RA:** Radio astronomy
- **RS:** Remote sensing systems
- **S:** Fixed-satellite service
- **SA:** Space applications and meteorology
- **SF:** Frequency sharing and coordination between fixed-satellite and fixed service systems
- **SM:** Spectrum management
- **SNG:** Satellite news gathering
- **TF:** Time signals and frequency standards emissions
- **V:** Vocabulary and related subjects

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Study Group Products



- Technical bases for WRC (and RRC)
 - ➡ CPM Report
- ITU-R Recommendations
- **Reports and Handbooks**

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Example Reports from ITU-R



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- Economic aspects of spectrum management
- Fixed service applications using free-space optical links
- Means of calculating low-orbit satellite visibility statistics
- Guidelines for evaluation of radio interface technologies for IMT-Advanced
- Transition from analogue to digital terrestrial broadcasting

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Example Handbooks from ITU-R



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- National Spectrum Management
- Spectrum Monitoring
- Satellite Communications (FSS)
- Radiowave Propagation information for designing terrestrial point-to-point links
- Use of radio spectrum for meteorology: weather, water, climate monitoring and prediction
- Digital terrestrial TV broadcasting
- Land mobile including wireless access
- Frequency adaptive systems

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Concluding remarks



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- ITU Radiocommunication Sector represents focal point for standardization of radiocommunication services and systems
- The **ITU-R Study Groups** are the “home” for the technical studies required for the standardization activities
- Principal products:
 - Technical bases for Radiocommunication Conferences
 - Recommendations, Reports and Handbooks

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Thank you!

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