ITU/WMO Seminar on:
Use of Radio Spectrum for Meteorology:
Weather, Water and Climate Monitoring and Prediction
Geneva, 16-18 September 2009

ITU Radiocommunication Standardization Activities

Kevin HUGHES
Chief of ITU-R Study Group Department
E-mail: kevin.hughes@itu.int

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Presentation

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

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)

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**

Principal Tasks of ITU-R Study Groups

Develop technical bases for WRCs (and RRCs)

e.g. CPM process for WRCs

Develop Recommendations

International voluntary ***Standards*** on:
- spectrum management, satellite orbits, frequency sharing
- system characteristics and operation

ITU-R represents:
International focal point for the standardization of wireless systems

Compile Reports and Handbooks

ITU-R Study Groups

- Groups of experts (> 1500)from ITU membership
- Currently 6 Stu
- Subordinate
  - Working Par
  - Group
  - Group
  - ion Committee for Voca
  - regulator
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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

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)

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

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)

Study Group 4
Satellite services

- 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

Study Group 5
Terrestrial services

- 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

Study Group 6 Broadcasting service

- Programme production
- Programme assembly
- Delivery
- Reception quality

- Sharing issues at UHF

- Multimedia and data broadcasting for mobile reception

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

ITU-R Study Groups on Internet

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

SG Web Page Structure (using SG 7 as a sample)

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Study Group 7 (SG 7) - Science services

Manage information

Scope

1 Systems for space operation, space research, Earth exploration and meteorology, including the related use of links in the inter satellite service.

2 Systems for remote sensing, including passive and active sensing systems, operating on both ground-based and space-based platforms.

3 Radio astronomy and radar astronomy.

4 Dissemination, reception and coordination of standard-frequency and time-signal services, including the application of satellite techniques, on a worldwide basis.

General Information

- Brochure
- Chairmen and Vice-Chairmen
- Counsellor
- Contributions submission: rsg7@itu.int
- Chairman's corner TIES
- Mailing lists - FTP server TIES
- ITU-R Electronic facilities

Publications

- ITU-R Questions - SG 7
- Recommendations - ITU-R RA Series
- Recommendations - ITU-R SA Series
- Recommendations - ITU-R RS Series
- Recommendations - ITU-R TF Series
- Reports - ITU-R RA Series
- Reports - ITU-R SA Series
- Reports - ITU-R RS Series

Next meeting

- Monday 07/09/09 - Monday 07/09/09
- Place : **Switzerland [Geneva]**
- Status : **Confirmed** - 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 Delegate Registration

Structure

- **Working Party 7A (WP 7A) - Time signals and frequency standard emissions**
- **Working Party 7B (WP 7B) - Space Radiocommunication Applications**
- **Working Party 7C (WP 7C) - Remote Sensing Systems**
- **Working Party 7D (WP 7D) - Radio astronomy**

Documents

- Contributions TIES XML ?
- Study Group 7 Summary Record (Meeting: 6 and 14/10/08) TIES
- Administrative Documents (ADM) TIES
- Information Documents (INFO) TIES
- Fascicles
- Status of texts English only
- Circular Letters (LCCE) XML ?
- Administrative Circulars (CA) XML ?
- Administrative Circulars (CACE) XML ?
- Administrative Circulars (CAR) XML ?
- Archives

Related activities

- Rec. ITU-R TF.583 (Time codes) English only
- Characteristics of standard-frequency and time-signal emissions (see also Rec. ITU-R TF.768 - Standard frequencies and time signals) English only

Current key priorities in ITU-R Standardization include:

- **Emergency communications**
- **Environmental monitoring**

Emergency Communications

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

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

Climate change

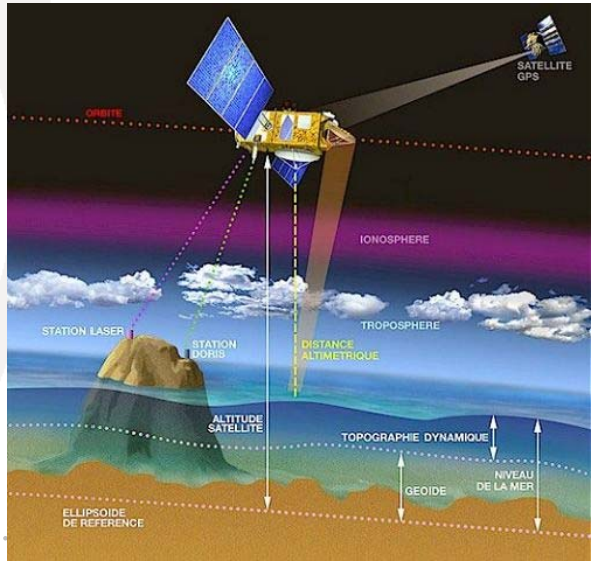
- ITU-R's standardization role on monitoring and mitigating the effects of climate change is very closely linked with that on Emergency Communications
- Through its responsibility for international spectrum management, ITU-R provides interference-free spectrum and satellite orbits for climate monitoring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

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



Study Group Products

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

Table of contents of the CPM Report to WRC-11

Chapters of CPM Report	WRC-11 Agenda items
1. Maritime and Aeronautical issues	1.3, 1.4, 1.9, 1.10
2. Radiolocation and Amateur issues	1.14, 1.15, 1.21, 1.23
3. Fixed, Mobile and Broadcasting issues	1.5, 1.8, 1.17, 1.20, 1.22
4. Science issues	1.6, 1.11, 1.12, 1.16, 1.24
5. Satellite issues	1.7, 1.13, 1.18, 1.25, 7
6. Future work programme and other issues	1.2, 1.19, 2, 4, 8.1, 8.2

Study Group Products

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

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

Study Group Products

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

Example Reports from ITU-R

- Economic aspects of spectrum management
- Sharing of the 10.6-10.68 GHz band by the fixed and mobile services and the Earth exploration-satellite service (passive)
- 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

Example Handbooks from ITU-R

- 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

Concluding remarks

- 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!