

ITU TRAINING ON SPECTRUM MANAGEMENT FOR TERRESTRIAL
SERVICES

VICTORIA, REPUBLIC OF SEYCHELLES, 5 - 9 OCTOBER, 2015

International Spectrum Management and Radio Regulations

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Radiocommunication Bureau

Overview of the ITU

- ITU assists in connecting the world since 1865

1865

2015



Specialized agency of UN : **193** Member-States,
almost **800** private-sector entities and
academic institutions

ITU is really international

- Based in Geneva, 12 regional and area offices, about 750 staff
- 6 official languages:
 - English, Arabic, Chinese, Spanish, French, Russian
 - meetings with interpretation
 - translation of documents
- Staff from the world: 80 countries
- Main documents: Constitution, Convention, **Radio Regulations**, International Telecommunication Regulations

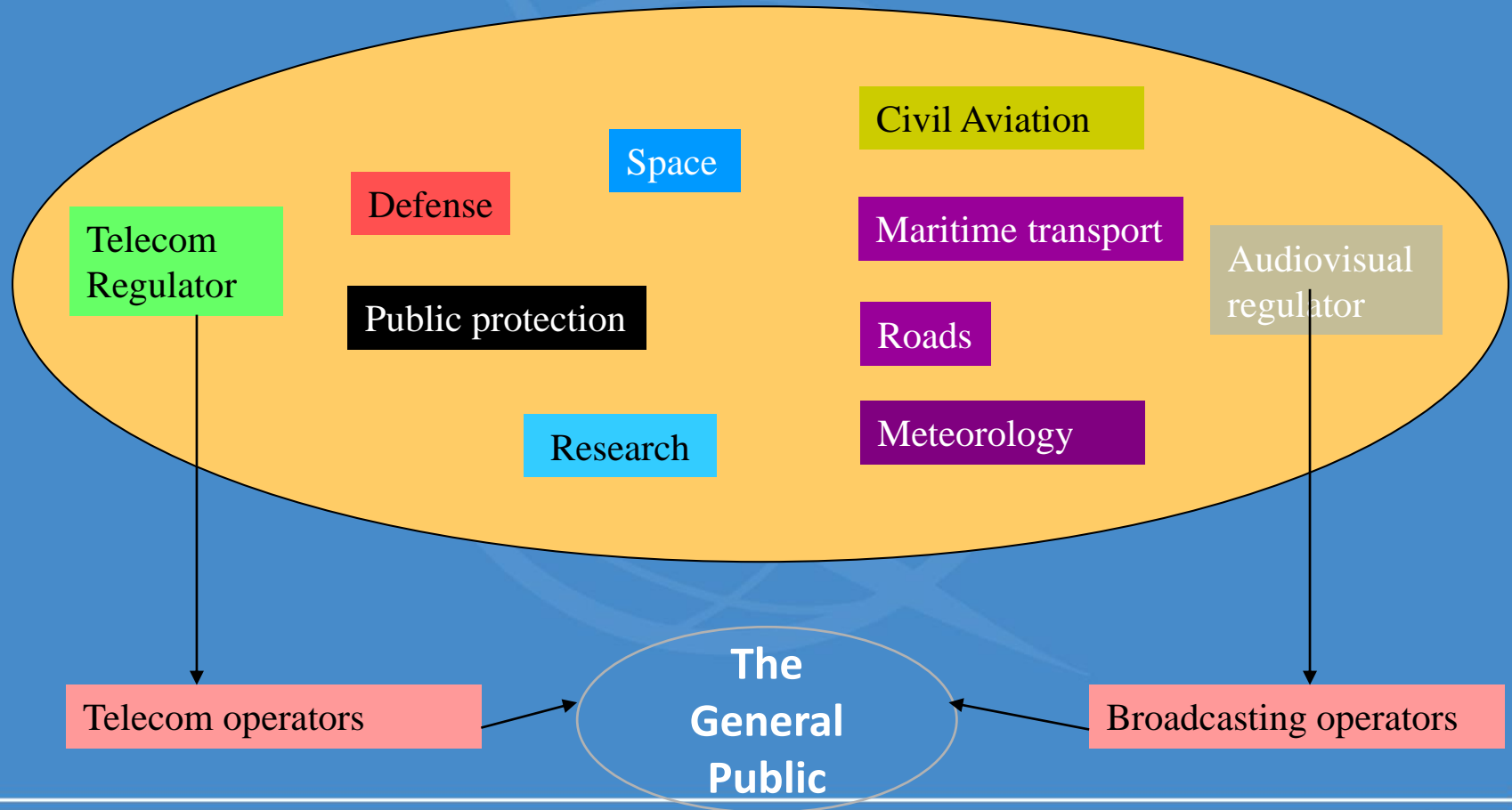


Purposes of the ITU

“The Union shall effect allocation of bands of the radio-frequency spectrum, the allotment of radio frequencies and the registration of radio frequency assignments and, for space services, of any associated orbital position in the geostationary-satellite orbit or any associated characteristics of satellite in other orbits, in order to avoid harmful interference between radio stations of different countries.”



The main users of spectrum



The main radiocommunication services

- Fixed, Mobile, Broadcasting
- Maritime, Aeronautical mobile
- Amateur
- Radiolocation, Radionavigation, Radiodetermination
- Earth Exploration
- Same services, by satellite
- Space Research
- Radioastronomy

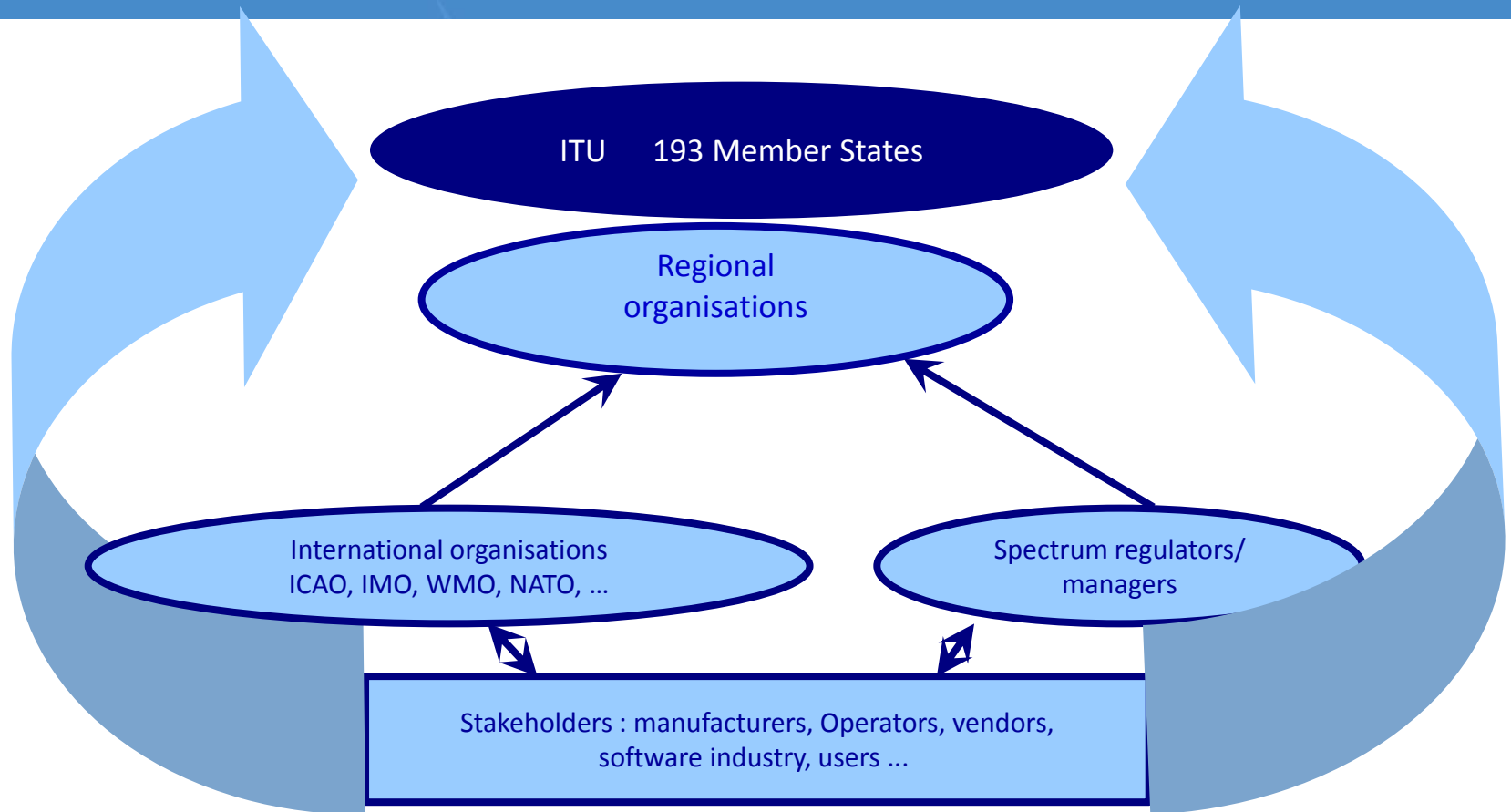
Key roles of the ITU-R

- Establish and update international regulations on spectrum/orbit use
- Apply the international regulations on spectrum/orbit use
- Produce global standards and associated material (recommendations, reports and handbooks) for optimum spectrum/orbit use
- Inform and assist membership on radiocommunication matters

Main elements of international regulations

- ITU Constitution, Convention and **Radio Regulations**
- Regional Agreements concluded under ITU auspices
 - Contain frequency plans, technical basis and procedures
 - Adopted and regional radiocommunication conferences
- Rules of Procedure
 - Approved by the Radio Regulations Board
 - Complement and clarify the Radio Regulations
- ITU-R Recommendations
 - Despite their non-mandatory nature serve as international technical standards, e.g. channel arrangements, system parameters
 - Instruments of other international organizations, e.g. ICAO Plan for aeronautical radionavigation service in 117.975 - 137 MHz

International negotiations



Radio Regulations

- RR is a single set of international regulations on spectrum/orbit use
- RR is intergovernmental treaty. Ratified by governments
- Define the rights and obligations of Member States in respect of the use of spectrum/orbit resources and explains how these rights may be obtained and kept
- Updated every 3-4 years by World Radiocommunication Conferences, WRCs
- Main goals of the RR:
 - interference free operation of stations
 - harmonization of spectrum usage



Content and concepts of the RR

- RR contains 4 volumes:
 - Volume 1 – Articles (main regulatory texts)
 - Volume 2 - Appendixes (technical bases, frequency plans)
 - Volume 3 - Resolutions and Recommendations of WRC (rules for specific services & systems, guidance for studies)
 - Volume 4 - ITU-R Recommendations incorporated in RR
- RR is based on 2 main concepts:
 - Allocation of frequency blocks to defined radio services through Table of Frequency Allocations (Articles 1 and 5)
 - Mandatory or voluntary regulatory procedures (coordination, notification, recording in the Master Register, resolving cases of harmful interference)

Allocation concept

- Article 1 of the RR
 - Gives definitions > 40 services, e.g. fixed, mobile, broadcasting
 - Example of definitions: *Mobile service* - communications involving stations used in motion or during halts at unspecified points
- Allocation concept: Frequency spectrum is divided in blocks. Frequency blocks are allocated to specific services (e.g. band 100 – 108 MHz is allocated to broadcasting service)
- Each radio service has several applications. Applications can use frequencies allocated to the service, examples:
 - GPS –
 - radar –
 - Ship station –
 - base station -
 - Radio navigation-satellite service
 - Radiolocation service
 - Maritime mobile service
 - Land mobile service

Types of allocations

Allocation to services		
Region 1	Region 2	Region 3
	75.4-76 FIXED MOBILE	75.4-87 FIXED MOBILE
	76-88 BROADCASTING Fixed Mobile	5.182 5.183 5.188
5.175 5.179 5.187	5.185	87-100 FIXED MOBILE BROADCASTING
87.5-100 BROADCASTING	88-100 BROADCASTING	
5.190		
100-108	BROADCASTING 5.192 5.194	

Primary and secondary

Worldwide and regional

By Table and by footnote

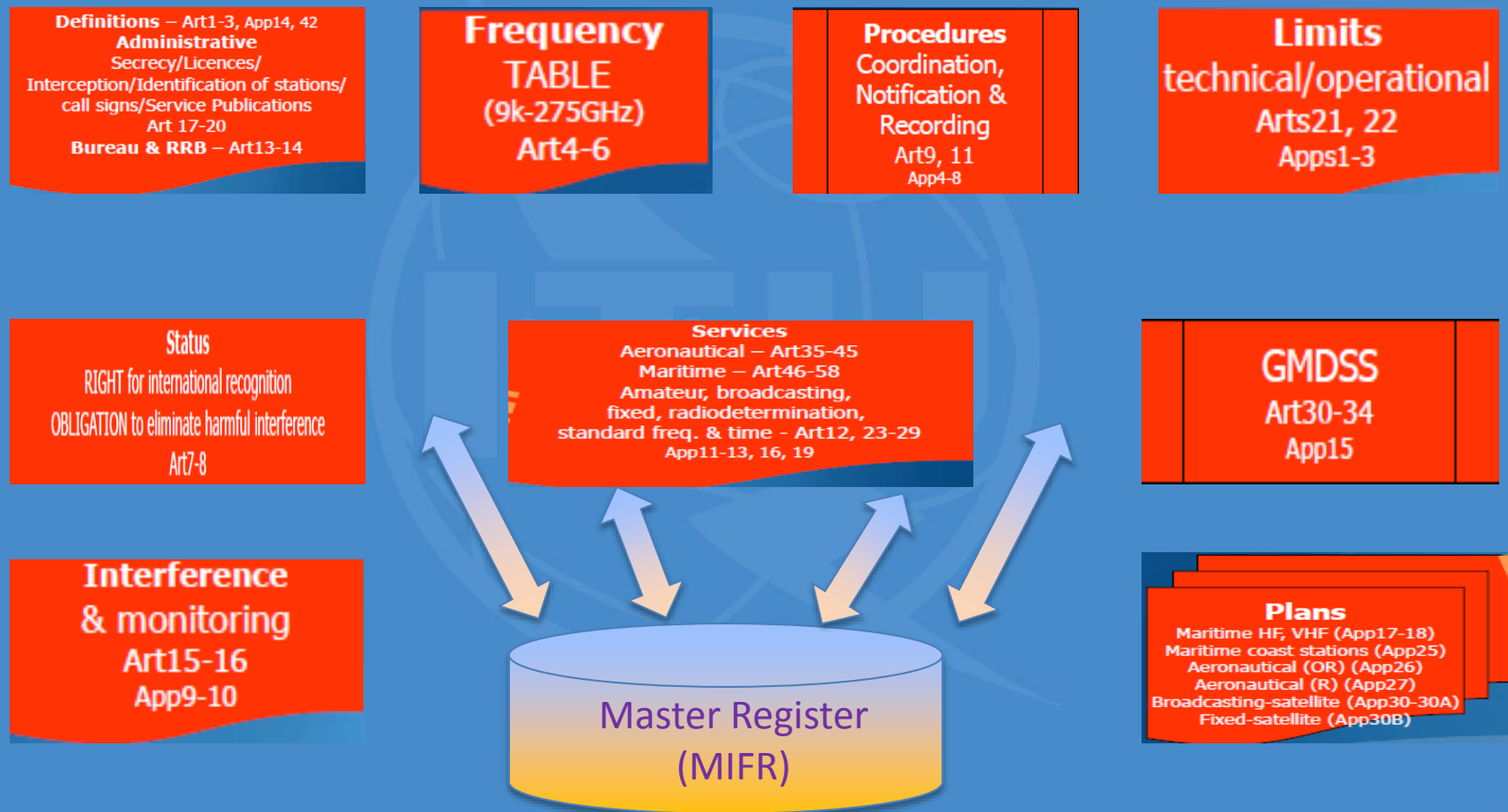
Exclusive and shared

5.192 *Additional allocation:* in China and Korea (Rep. of), the band 100-108 MHz is also allocated to the fixed and mobile services on a primary basis. (WRC-97)

Allocation types and categories

- Worldwide, regional and country allocations
 - Reflect different level of harmonization of spectrum use
- Exclusive and Shared
 - *Exclusive* – allocation of band to one radio service
 - *Shared* - allocation for several radio services (compatible radio services, often with similar technical characteristics)
- Category of services: Primary and Secondary
 - *Secondary* shall cause no harmful interference , nor claim protection from the *Primary*
- Allocations by the Table <-> allocations by footnotes
 - Footnotes often specify additional operational conditions
 - **Equal** status of allocations by Table and by a footnote, if no conditions specified

Key elements of the Radio Regulations



RR purposes

- Allocation of frequency bands to radio services
- Mandatory technical parameters to be observed by radio stations, especially transmitters
- Procedures to be followed to acquire rights to use spectrum/orbit
 - >In order to avoid harmful interference
- Identification of certain frequency bands for harmonized usage, e.g. International Mobile Telecommunications (IMT)
 - >In order to enable economies of scale, interoperability and roaming.

Rules of procedure (RoPs)

- RoPs – regulatory document (296 pages). Approved by Radio Regulations Board (12 officials, meet 3 times x 5 days a year)
- Purpose of RoPs: to clarify those provisions of the RR and Regional Agreements, which are difficult for practical applications (or may be interpreted differently)
- Types of Rules of Procedure:
 - Rules on the Radio Regulations and Regional Agreements
 - Rules standardizing the practices of BR
 - Technical standards (Part B)
- Draft RoPs are prepared by the BR, circulated through ITU administrations (comments), then discussed and approved by the RRB. Final goal – to transfer RoPs to the RR

Examples of the RoPs

- **Example 1.** RR 11.13 says: **frequencies** for **common use** shall not be notified to the ITU. What are these common frequencies ?
 - To clarify this RoP on 11.13 was approved. It gives the list of these common frequencies
- **Example 2:** RR11.31 says: notifications to the Master Register shall be verified vis-a-vis Table of Frequency Allocations and the other provisions of the RR. What does it mean “**conformity with the Table** ” and “**the other provisions**” ?
 - RoP on 11.31 explains how to do these verifications
- **Example 3:** RR 5.292 allocates 470-512 MHz to the fixed and mobile services subject to **coordination under RR 9.21**. What are criteria for coordination to identify affected countries ?
 - Part B6 of RoPs gives coordination distances

Apply the Radio Regulations

- Procedures for coordination and recording of frequency assignments
 - Mandatory and voluntary coordination
 - Coordination in border areas and global (satellite, HF)
- Establish international recognition and protection of spectrum use in each country
- Monitor spectrum use and settle interference disputes.
 - > Protection of investments in telecom

RR Provide long term commitment from all regulators and governments worldwide for a stable regulatory environment.

Produce global standards/material for optimum spectrum/orbit use

- Push technologies and practices to enhance spectrum efficiency
- Examples
 - IMT Advanced specifications adopted in 2012
 - IMT-2020 Vision to be adopted in October 2015

4. Inform and Assist Membership

- In applying the Radio Regulations
- In organizing and developing radiocommunications
- In coordinating and harmonizing spectrum use at regional level
- Trough seminars, forums, workshops, direct assistance:
www.itu.int/en/events/Pages/Workshops-and-Seminars.aspx
- Publications:
 - Radio Regulations (RR)
 - Service documents e.g., BR International Frequency Information Circular (IFIC)
 - ITU-R Recommendations (online subscriptions, CD/DVD-ROM , paper)
 - Handbooks & Reports

ITU-R publications

ITU Publications : Radiocommunication (ITU-R)

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Terminology

Radiocommunication Sector (ITU-R)

constitute an essential reference source for all those wishing to remain abreast of the rapid and complex the world of international radiocommunications, such as government agencies, public and private operators, manufacturers, scientific or industrial bodies, international organizations, consultancies, al institutions, etc.

able in paper format, on CD-ROM, DVD and online (one-time downloads or annual subscriptions) in the languages (, Arabic, Chinese, English, French, Spanish and Russian).

nication Bureau publishes regulatory texts such as the Radio Regulations, the Final Acts of World and unication Conferences and the Rules of Procedure, as well as ITU-R Recommendations, Reports and by the Radiocommunication Study Groups.

Radiocommunication Sector (ITU-R)

<http://www.itu.int/en/publications/ITU-R/Pages/default.aspx>

ITU-R WEB page



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RA-15

Radiocommunication Assembly 2015 (RA-15)

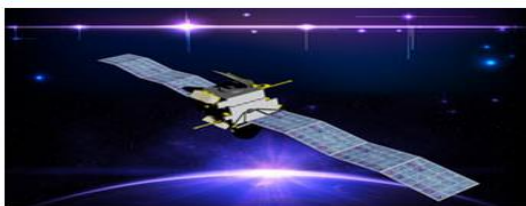
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- Entites
- Highlights
- Free Resources
- FAQs

- World Radiocommunication Conferences (WRC)
- Radiocommunication Assemblies (RA)
- Regional Radiocommunication Conferences (RRC)
- Radio Regulations Board (RRB)
- Radiocommunication Study Groups
- Radiocommunication Advisory Group (RAG)

SPACE SERVICES



- BRIFIC
- SNL
- SNS
- Space Plans

International coordination, notification and recording procedures for **space systems and earth stations** and examination of frequency assignment notices submitted by Administrations (Membership) for inclusion in the

TERRESTRIAL SERVICES



- BRIFIC
- GLAD
- MARS
- WISFAT

International coordination, notification and recording procedures for **terrestrial systems** and examination of frequency assignment notices submitted by Administrations (Membership) for inclusion in the **Master**

- Events
- Conferences & Meetings
- Seminars & Workshops

- ITU Workshop on the Efficient Use of the Spectrum/Orbit Resource - Confirmed
2015-09-29 - 2015-09-29 DA NANG, VIET NAM
- ITU International Satellite Symposium 2015 - Confirmed
2015-09-30 - 2015-10-01 DA NANG, VIET NAM
- RRB-15.3 - Confirmed
2015-10-19 - 2015-10-23 GENEVA, SWITZERLAND
- RA-15 - Confirmed
2015-10-26 - 2015-10-30 GENEVA, SWITZERLAND
- WRC-15 - Confirmed
2015-11-02 - 2015-11-27 GENEVA, SWITZERLAND



Thank you !