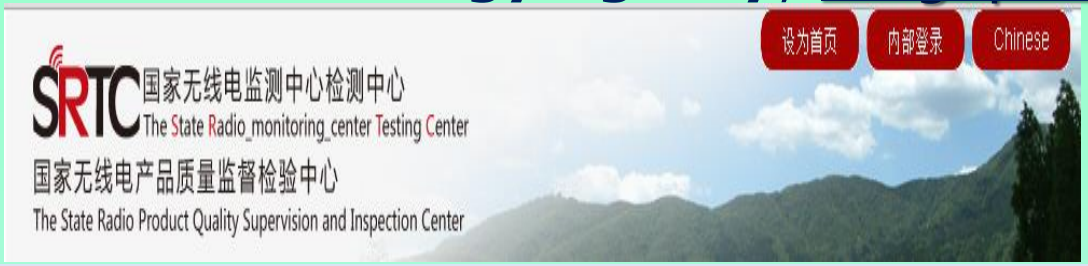
Defence Science & Technology Agency; Singapore; 5 Jan. 2016



State Radio monitoring center Testing Center (SRTC) Beijing; 8 Jan.2016

Xihua University; Chengdu, Sichuan, China: 11 Jan. 2016

ATDI
advanced radiocommunications

ATDT Warsaw 4 Feb. 2016

Key outcomes of ITU WRC-15

More info: World Radiocommunication Conference 2015 (WRC-15) & Provisional Final Acts

Dr. Haim Mazar; Vice Chair ITU-R Study Group 5 (Terrestrial Services)
h.mazar@atdi.com & mazar@ties.itu.int
http://mazar.atwebpages.com/ & http://www.haim-mazar.com/

Around 3,300 participants, 162 out of ITU's 193 Member States, circa 500 participants representing 130 other entities, incl. industry, as observers

World radiocommunication conference (WRC)

1. WRCs are held every 3–4 years
2. WRC reviews & revises the Radio Regulations (RR) the international treaty governing the use of the RF & the geostationary-satellite & non-geostationary-satellite orbits
3. Revisions are made on the basis of agenda determined by the ITU Council
4. Agenda is established four to six years in advance; final agenda set by the ITU Council two years before the conference

Under terms of ITU Constitution WRC can

- Revise the RR & any associated RF assignment & allotment Plans
- Address any radiocommunication matter of worldwide character
- Instruct Radio Regulations Board & the R- Bureau, & review their activities
- Determine Questions for study by the Radiocommunication Assembly and its Study Groups in preparation for future Radio Conferences

Conference Preparatory Meeting CPM Report

Based on contributions from administrations, R-Study Groups, & other sources concerning the regulatory, technical, operational & procedural matters to be considered by World and Regional Radiocommunication Conferences, the Conference Preparatory Meeting (CPM) prepares a consolidated report to support the work of such conferences -

WRC-15 Main Results: Mobile Broadband (BB)

1. Mobile broadband in **694–790 MHz** in ITU Region-1 (Europe, Africa, the Middle East and Central Asia) a global harmonization for the digital dividend
2. Germany (June 15; over €1 billion) & France (Nov. 15, €2,8 billion) already auctioned the 700 MHz band
3. Protection to TV, aeronautical radionavigation in this band
4. 470–690 MHz remains exclusively to TV in Region1, for at least a decade; to be reviewed only on 2023
5. L-band (1427–1518 MHz) improves coverage & capacity
6. Harmonize 200 MHz of C-band (3.4–3.6 GHz), to improve capacity in urban areas; used in small cells

WRC-15 Main Results: Mobile Broadband (BB) 2

1. Additional portions in other bands were allocated to mobile BB in regions, where there was no interference with other services
2. Studies in the agenda for WRC 2019 to identify bands above 6 GHz for greater capacity. Administrations and industry concentrate to develop necessary technologies for implementation of IMT-2020
3. 5G services, mainly above 24 GHz; e.g., 31.8–33.4 GHz, for short range applications

WRC-15 Main Results: Satellite Communications

1. Additional FSS (Fixed Satellite Service) spectrum needs in the 51.4–52.4 GHz
2. WRC-23 agenda will consider additional spectrum in 37.5–39.5 GHz
3. FSS links for Unmanned Aerial Systems: drones
4. Earth observation satellites for environmental monitoring:
    1. allocations in 7–8 GHz to uplink for future missions of earth-exploration satellite services (EESS)
    2. Allocations in 9–10 GHz to develop broadband sensing technologies & space-borne radars on active sensing EESS. Scientific and geo-information will provide measurements in all weather conditions for disaster relief and humanitarian aid, land use & large-area coastal surveillance

Key Maritime Issues

1. **Broadband satellite: Earth Stations in Motion (ESIM)**

Deployment in 19.7–20.2 & 29.5–30.0 GHz in fixed-satellite service (FSS), to provide global broadband. Earth stations on-board moving platforms, such as ships, trains & aircraft, to communicate with high power multiple spot beam satellites, allowing 10–50 Mbits/s

2. **Enhanced maritime communications: Automatic Identification System (AIS)**

New data exchange to improve safety of navigation. New allocations in downlink 161.9375–161.9625 MHz & uplink 161.9875–162.0125 MHz to maritime mobile-satellite (MMSS). Studies continue on compatibility between MMSS downlink & incumbent services in-band & adjacent bands

Public Protection & Disaster Relief (PPDR) and Safety

1. **Emergency communications and disaster relief**
   WRC-15 identified spectrum in 694–894 MHz to facilitate mobile BB for robust & reliable mission critical emergency services in PPDR, such as police, fire, ambulances & disaster response teams.
   Significant updates to Resolution 646 on PPDR.
2. **Amateur radio service gets new allocation**
   New allocation in 5351.5 - 5366.5 kHz for stable communications over various distances, especially for communications in disaster situations and for relief operations
3. **Search and rescue**
   WRC-15 reinforced beacons' protection in the 406-406.1 MHz uplink, such as the Cospas-Sarsat system.
   Resolution 205 was modified to avoid drifting close to 406 MHz
4. **Road Safety**
   Short-range high-resolution **automotive radar** in 77.5–78 GHz.
   Globally harmonized regulatory framework to prevent collisions

WRC-15 Main Results: Aviation and Avionics

1. **Unmanned aircraft systems (UAS)**
   WRC-15 opened the way for the development by ICAO of worldwide standards for UAS, and identified regulatory conditions to such systems
2. **Wireless Avionics Intra-Communications (WAIC)**
   RF to allow for the heavy and expensive wiring used in aircraft to be replaced by wireless systems (Fly By Wireless)
3. **Global flight tracking for civil aviation**
   RF for global flight tracking in civil aviation for improved safety. 1**087.7–1092.3** MHz has been allocated to aeronautical mobile-satellite service (Earth-to-space) for reception by space stations of Automatic Dependent Surveillance-Broadcast (ADS-B) emissions from aircraft transmitters, to report position of aircraft

Resolution 809 (WRC-15): shortened & highlighted WRC 2019 Agenda (1)

1.1 allocation of 50-54 MHz to the amateur service in Region 1;

1.2 power limits for earth stations in the mobile-satellite service, meteorological-satellite service and Earth exploration-satellite service in 401-403 MHz and 399.9-400.05 MHz;

1.5 use of 17.7-19.7 GHz (space-to-Earth) and 27.5-29.5 GHz (Earth-to-space) by earth stations in motion communicating with geostationary space stations in the fixed-satellite;

1.8 support Global Maritime Distress Safety Systems (GMDSS) modernization and to support the introduction of additional satellite systems into the GMDSS;

1.9 to consider, based on the results of ITU-R studies:

1.9.1 156-162.05 MHz for autonomous maritime radio devices to protect the GMDSS and automatic identifications system (AIS);

1.9.2 new spectrum allocations to the maritime mobile-satellite service (Earth-to-space and space-to-Earth), preferably within the frequency bands 156.0125-157.4375 MHz and 160.6125-162.0375 MHz, to enable a new VHF data exchange system (VDES) satellite component;

1.10 use of Global Aeronautical Distress and Safety System (GADSS);

Resolution 809 (WRC-15): shortened & highlighted WRC 2019 Agenda (2)

1.11 support railway radiocommunication systems between train and trackside within existing mobile service allocations, in accordance with Resolution **236 [COM6/12] (WRC-15)** (Beijing-Amsterdam);

1.12 evolving Intelligent Transport Systems (ITS);

1.13 identification of frequency bands for IMT, including possible additional allocations to the mobile service on a primary basis;

1.14 regulatory actions for high-altitude platform stations (HAPS), within existing fixed-service allocations Google & Facebook);

1.15 land-mobile and fixed services applications operating in 275-450 GHz;

1.16 wireless access systems, including radio local area networks (WAS/RLAN), between 5 150-5 925 MHz, including additional spectrum allocations to the mobile service

Resolution 810 (WRC-15): Preliminary WRC 2023 Agenda

2.1 support Global Maritime Distress and Safety System (GMDSS);

2.2 new allocation to the Earth exploration-satellite (active) service for spaceborne radar sounders around 45 MHz;

2.3 regulating space weather sensors;

2.4 new allocations to the fixed-satellite service in 37.5-39.5 GHz (Earth-to-space);

2.5 spectrum use and spectrum needs of existing services in the frequency band 470-960 MHz in Region 1 and consider possible regulatory actions in the frequency band 470-694 MHz in Region 1

Urgent studies required in preparation for the 2019 World Radiocommunication Conference

1. Wireless Power Transmission (WPT) for electric vehicles
   a) impact of WPT on radio services;
   b) suitable harmonized frequency ranges
2. Examine unauthorized earth stations terminals
3. Internet of Things: Narrowband and broadband machine-type communication infrastructure

CPM19-1 in Geneva from 30 Nov. to 1 Dec. 2015

1. Organized preparatory studies for WRC-19 & proposed a structure for its Report
2. Nominated 6 Chapter Rapporteurs to assist the Chairman in managing the development of the draft Report to WRC-19
3. With one exception, all the preparatory work will be performed within the ITU-R Study Groups
4. ITU-R SG5 will establish a dedicated Task Group (TG 5/1) to deal with complex issues related to WRC-19 agenda item 1.13


Houlin Zhao
ITU Secretary-General
Dr. Haim Mazar
François Rancy
ITU-R Director
RADIO

The booth of ATDI at WRC-15

The booth of ATDI at WRC-15

Geneva, 17 Nov 2015
football match: WRC-15 participants vs. ITU staff

Official ITU announcement at screens on 17 Nov 15: football match **WRC-15** at 12:00-14:00 Varembé Stade

Many Thanks; Any Qs?

More info: World Radiocommunication Conference 2015 (WRC-15) & Provisional Final Acts

Dr. Haim Mazar; Vice Chair ITU-R Study Group 5 (Terrestrial Services)

mazar@ties.itu.int & h.mazar@atdi.com

http://mazar.atwebpages.com/ & http://www.haim-mazar.com/