



ITU WORKSHOP ON
SHORT RANGE DEVICES AND
ULTRA WIDE BAND

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ITU WORKSHOP on
SHORT RANGE DEVICES (SRDs)
AND ULTRA WIDE BAND (UWB)
(Geneva, 3 June 2014*)

Existing SRD related ITU-R deliverables

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* in conjunction with the June 2014 block of
meetings of ITU-R Study Group 1



Overview



Terms and Definitions

Studies on ISM

Studies on SRDs, incl. RFIDs

Studies on UWB

Short Range (radio or radiocommunication) Devices (SRDs)

as per Report ITU-R SM.2153-4 referred to in Rec. ITU-R SM.1896

- For the purpose of this Report the term **SRD** is intended to cover radio transmitters which provide either unidirectional or bidirectional communication and which have low capability of causing interference to other radio equipment
- Such devices are **permitted to operate on a non-interference and non-protected basis.**
- **SRDs** use either integral, dedicated or external antennas and all types of modulation and channel pattern can be permitted **subject to relevant standards or national regulations**
- **Simple licensing requirements may be applied**, e.g. general licences or general frequency assignments or even licence exemption, **however, information about the regulatory requirements for placing short-range radiocom. equipment on the market and for their use should be obtained by contacting individual national administrations**



Terms and Definitions - RFID



as per Report ITU-R SM.2255

RFID: Radio-Frequency Identification

RFID tag: any transponder plus the information storage mechanism attached to the object

RFID system:

- an automatic identification and data capture system comprising one or more RFID reader (interrogators) and one or more RFID tags (transponders) in which data transfer is achieved by means of suitably modulated inductive or radiating electromagnetic energy.
- A tag is attached to the item to be identified, and a transmitter/receiver unit interrogates the tag and receives identification data back from the tag.

RFID devices are considered:

active if self-powered – i.e. contain their own batteries and are always on, and
passive if receive power from an external source – i.e. radio frequencies transmitted by readers



Terms and Definitions - UWB



as per Recommendation ITU-R SM.1755:

Ultra-wideband technology (UWB):

- Technology for short-range radiocommunication, involving the intentional generation and transmission of radio-frequency energy that spreads over a very large frequency range, which may overlap several frequency bands allocated to radiocommunication services
- Devices using UWB technology typically have intentional radiation from the antenna with either a –10 dB bandwidth of at least 500 MHz or a –10 dB fractional bandwidth greater than 0.2 (see calculation formulae in Rec. ITU-R SM.1755)

Notes: Administrations authorizing/licensing use of UWB devices:

- should ensure this use on a non-interference/non-protection basis with respect to radiocommunication services (RS) operating in accordance with provisions of the Radio Regulations;
- should take immediate action(s) to eliminate interference to RS



Terms and Definitions - ISM



Definition as per **No. 1.15** of Radio Regulations (RR):

Industrial, Scientific and Medical (ISM) applications (of radio energy)

Operation of equipment or appliances designed to generate and use locally radio frequency energy for industrial, scientific, medical, domestic or similar purposes, excluding applications in the field of telecommunications.

Bands designated for ISM are listed in RR Nos. **5.138 and **5.150** as well as in No. **5.280** for some European countries**

RR No. **15.13: mandatory provisions to ADMS to ensure that radiation from ISM equipment is minimal in ISM bands and is at a level that does not cause harmful interference outside ISM bands to a radiocommunication service and, in particular, to a radionavigation or any other safety service operating in accordance with RR provisions.**

(Similar provisions as above for “outside ISM bands exist in **RR No. **15.12**** for electrical apparatus or installations of any kind)

(Administrations should be guided by the latest relevant ITU-R Recommendations)

WRC-12 agenda item 8.1 issue A, Res. 63 (Rev.WRC-07): Protection of radiocom. services against interference caused by radiation from ISM equipment

- **Report ITU-R SM.2180**: Impact of ISM equipment on radiocommunication services
 - Refers to ISM equipment emission limits of **CISPR Publication 11**
 - Are appropriate limits to protect analogue radiocommunication systems
 - **Need new studies for protection of digital radiocommunicat. systems**
- **See CPM Report on Res. 63 (Rev. WRC-07) by WP 1A**
- **WRC-12 outcomes on Res. 63 (Rev. WRC-12)**
 - **Still need limits to be imposed on radiation from ISM equipment, within and outside the frequency bands designated in the RR**
 - **Continue collaboration with CISPR in order to ensure adequate protection of radio. services, including digital radio. systems**

By ITU-R Working Party 1A: Spectrum Engineering Techniques

- Recommendation ITU-R SM.1056 –
Limitation of radiation from ISM equipment
 - **Recommends use of latest edition of CISPR Publication 11**
 - Provides ITU definition of ISM applications (Heating equipment; Medical equipment; Microwave equipment; etc.)
 - Provides a list of frequencies typically used by ISM equipment and Radiation levels inside bands designated for ISM applications
 - Describes some current and future ISM applications
- Recommendation ITU-R SM.2028 – Protection distance calculation between inductive systems & radiocommunication services using frequencies below 30 MHz
 - **Recommends to take all necessary precautions to ensure not causing interference to radiocommunication services**
 - Provide a calculation procedure of protection distance between inductive system and radiocommunication services



WRC-12 agenda item 1.22: Examination of the effect of emissions from SRDs on radiocommunication services, in accordance with Res. 953 (WRC 07)

- **Report ITU-R SM.2210** (2011): Impact of emissions from SRDs on radiocommunication services (RS)
 - **Different approaches can ensure RS protection from SRDs: define SRD emission masks and exclusion, restricted or harmonized bands;**
 - **Noting that SRDs are certified and regulated at the national level;**
 - **further developments and studies can be carried within ITU-R and lead to new/revised Rec. & Rep. providing guidance to administrations**
- **See CPM Report on WRC-12 agenda item 1.22 by WP 1A**
- **WRC-12 outcomes on agenda item 1.22**
 - **No need to modify the Radio Regulations, except from SUP Res. 953 (WRC-07)**
 - **ITU-R harmonization studies can continue in response to Res. ITU-R 54-1**



By ITU-R Working Party 1C: Spectrum Monitoring issues

- Report ITU-R SM.2154 – SRD spectrum occupancy measurement techniques

Issues to be considered in the Measurement (based on an example of a 863-870 MHz monitoring campaign): locations, time period, scanning speed, sensitivity, real-time and mobile measurement, detection threshold, antenna, receiving system quality

- Report ITU-R SM.2179 – SRD measurements

Complete the set of ITU-R Recommendations and Reports by documenting the measurement methods available for SRDs in: CEPT, USA (FCC), CAN and IEC/ISO

By ITU-R Working Party 1B: Spectrum Management issues

- Studies in response to former Question ITU-R 213/1 (Technical and operating parameters and spectrum requirements for SRDs) & now Resolution ITU-R 54-1 (Studies to achieve harmonization for SRDs)
- Recommendation ITU-R SM.1896 –
Frequency ranges for global or regional harmonization of SRDs
 - **ranges appropriate for global harmonization:**
9-148.5 kHz; 3155-3400 kHz (low power wireless hearing aids, RR No. 1.116);
and following ISM bands listed in RR Nos. 1.138 and 1.150:
6765-6795 kHz; 13.553-13.567; 26.957-27.283; 40.66-40.7 MHz;
2400-2500 (2 483.5 MHz in some countries); **5725-5875 MHz;**
24.00-24.25; 61.0-61.5; 122-123; 244-246 GHz
 - **ranges appropriate for regional* harmonization:**
(* bands entirely or just partly available in a Region or only in some countries)
7400-8800 kHz; 312-315 MHz; 433.050-434.790 MHz;
862-875 kHz (not in Reg. 2); **875-960 MHz**

By ITU-R Working Party 1B: Spectrum Management issues (Cont'd)

- Report ITU-R SM.2153 – **Technical and operating parameters and spectrum use for SRDs** (replaces former Rec. ITU-R SM.1538)
- **Provides SRD definitions and short description of different applications using SRDs** (Telecommand, Telemetry, Voice and video, For detecting avalanche victims, RLANs, Railway applications, Road transport and traffic telematics, For detecting movement and equipment for alert, Alarms, Model control, Inductive applications (e.g. car access), Radio microphones, RFID, ULP-active medical implant, Wireless audio applications (e.g. cordless loudspeakers), RF (radar) level gauges), **among many others not listed**
- **Indicates typical technical characteristics/limitations: Common frequency ranges; Required radiated power or magnetic/electric field-strength values to allow satisfactory operation** (for CEPT countries, USA(FCC)/B/CAN, J and KOR); **Antenna requirements**

(.../...)

By ITU-R Working Party 1B: Spectrum Management issues (Cont'd)

➤ Report ITU-R SM.2153 (Cont'd)

- **Explains administrative requirements on**

- **Certification and verification** (e.g. EU-EFTA MS R&TTE directive; USA-FCC Part 15; KOR Radio Waves Acts Article 46; B/Anatel Res.);
- **Licensing requirements** (When the efficient use of the frequency spectrum is not at risk and as long as harmful interference is unlikely, installation and use of the spectrum or radio equipment may be exempt from a general licence or an individual licence; SRDs are generally exempted from individual licensing, but exceptions may be made based on national regulations).
- **Mutual agreements between countries/regions**
(e.g. Mutual Recognition Agreements (MRAs) of conformity test results)

- #### - **Provides also useful information on national/regional rules (incl. technical and operational parameters and spectrum use) in CEPT countries, USA, CHN, J, KOR, B, UAE, RCC countries, and in some APT member countries/territories**

By ITU-R Working Party 1B: Spectrum Management issues (Cont'd)

- Report ITU-R SM.2255 – Technical characteristics, standards and frequency bands of operation for RFID and potential harmonization opportunities

Outlines key standards, operating parameters & freq. bands for deployment of RFIDs in various administrations

- refers to applications including retail and supply chain, healthcare, transportation and logistics, e-passport and mobile applications;
- refers to technical specifications for the deployment of RFIDs in CAN, B and in CEPT countries.

Includes information on harmonization possibilities and framework for future work

Developed by former ITU-R Task Group 1/9 (2000-2007):

Compatibility between UWB devices and radiocom. Services

- Studies in response to former Questions [ITU-R 226/1](#) (Spectrum management framework related to the introduction of UWB devices) & [ITU-R 227/1](#) (Compatibility between UWB devices and radiocommunication services)

Now by Working Party 1A: Spectrum Engineering Techniques

- [Rec. ITU-R SM.1754](#) – Measurement techniques of UWB transmissions
- [Rec. ITU-R SM.1755](#) – Characteristics of UWB technology
- [Rec. ITU-R SM.1757](#) – Impact of devices using UWB technology on systems operating within radiocommunication services
- [Report ITU-R SM.2057](#) – Studies related to the impact of devices using UWB technology on radiocommunication services

Now by Working Party 1B: Spectrum Management issues

- [Rec. ITU-R SM.1756](#) – Framework for the introduction of devices using UWB technology



Thank you!

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**On-going SG 1 block of meetings, ITU HQ, Geneva from 3 to 12 June 2014
see, announcement letters in BR Circulars [1/LCCE/95](#) and [CACE/660](#)**