



Regional ITU Consultation on Conformance Assessment and Interoperability (Nairobi, Kenya, 30-31 July 2010)

Test Centre Facilities Regulatory Test Lab

Presented by
Bill McCrum
Consultant
Telecommunication
Standardization
Bureau



Test Centre Purpose

- Regulatory Testing
 - simpler purpose than interoperability testing
 - potentially less costly to set up
 - well defined standards and mandate
 - fundamental to marketplace order
 - could be seen as a first step towards interoperability testing services



Foundational Elements Underpinning Regulatory Test Centres

- Technical Regulations
- Technical standards/specifications
 - wireless
 - wireline
 - EMC
 - SAR
 - Electrical Safety
 - Other e.g. EMI



Legal Framework and Credentials

- Acts and Regulations covering:
 - telecommunications
 - radiocommunications
 - broadcasting
 - health aspects of EM radiation
 - EMC
 - Electrical Safety



Legal Framework and Credentials

- Accreditation in compliance with:
 - **ISO/IEC 17025** Testing and Calibration Lab Competence
 - **ISO/IEC Guide 65** Requirements for CBs
 - **ISO/IEC 17011** Requirements for Accreditation Bodies



Typical Functions of a Regulatory Test Centre

- Certifying/registering wireless and telecom equipment pursuant to Radiocommunication and Telecommunications legislation;
- Approving and registering test facilities;
- Conducting market surveillance, auditing and testing of wireless (radio frequency and SAR) and telecommunications terminal equipment;
- Providing support in the development of terminal, wireless and SAR standards, and in particular in testing methodologies;
- Provision of Spectrum/Telecom measurement services, including specialized lab tests and field studies or surveys in support of spectrum engineering questions or in interference investigation/resolution.



Expertise Required for Operation of a Regulatory Test Centre

- New technology testing and compliance verification (radio equipment, terminal equipment, broadcasting equipment);
- Radio Frequency (RF) Exposure;
- Interference Investigations;
- Standards Development;
- Interpretation of regulatory requirements and procedures;
- Validation of Test Methods; and
- Accreditation of Test Facilities.



Conformity Assessment Regimes

- Certification - used for radio and broadcasting equipment such as licensed apparatus. A Certification Body (CB) issues a certificate based on the assessment of the test report produced by a testing laboratory.
- Declaration of Conformity (DoC) - used for telecommunications apparatus.
- Supplier's Declaration of Conformity (SDoC) - used for low risk radio and broadcasting equipment such as unlicensed devices. The responsible party (manufacturer, testing laboratory, certification body, supplier) tests the equipment and ensures that it meets the appropriate technical standards.



Test Centre Components

- Wireless Lab
- Wireline Lab
- SAR Lab
- Calibration Lab



Wireless Test Lab Equipment

- Antenna Tower
- Antennas (Loop, Biconical, Dipole, Monopole)
- Audio Analyzer
- Controller
- DC Power Supply
- Horn Antenna
- Hybrid Junction
- Line Impedance Stabilization Network (LISN)
- Log Periodic Antenna
- Miscellaneous (attenuators, connectors, adapters)
- Modulation Analyzer
- Multimeter

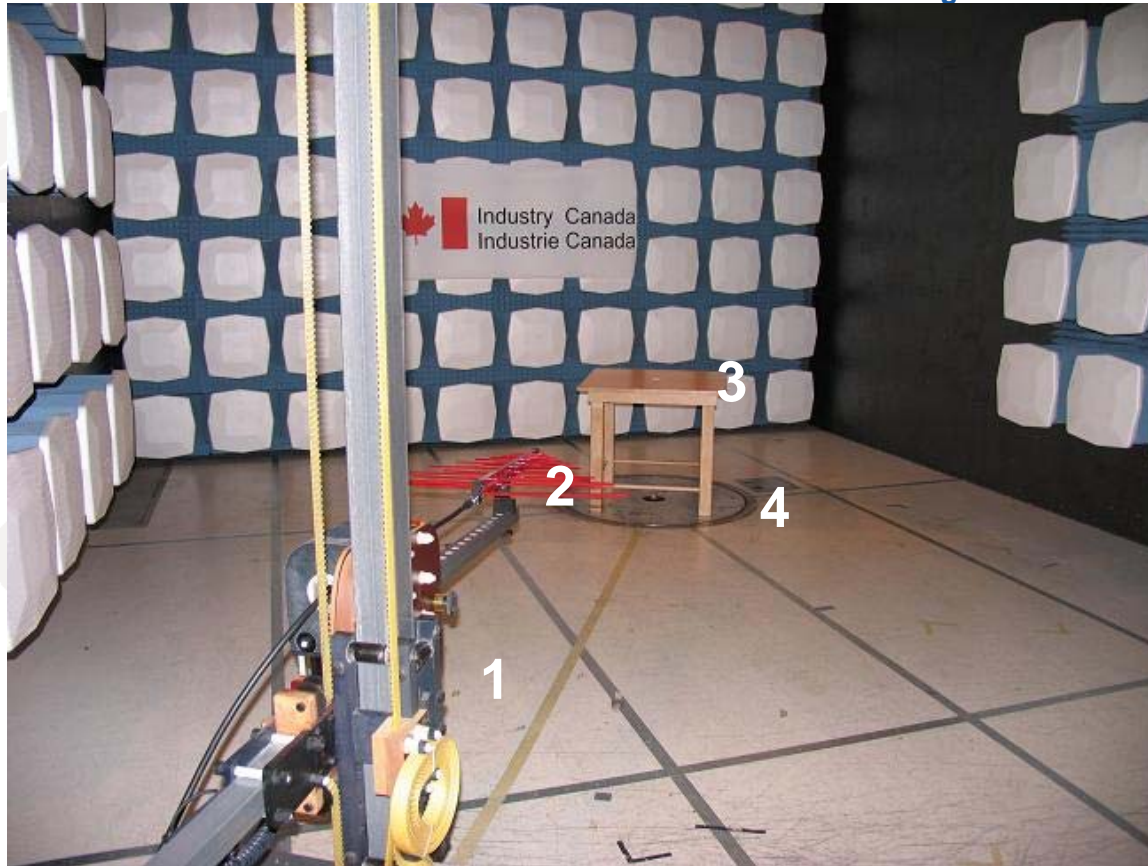


Wireless Test Lab Equipment (contd)

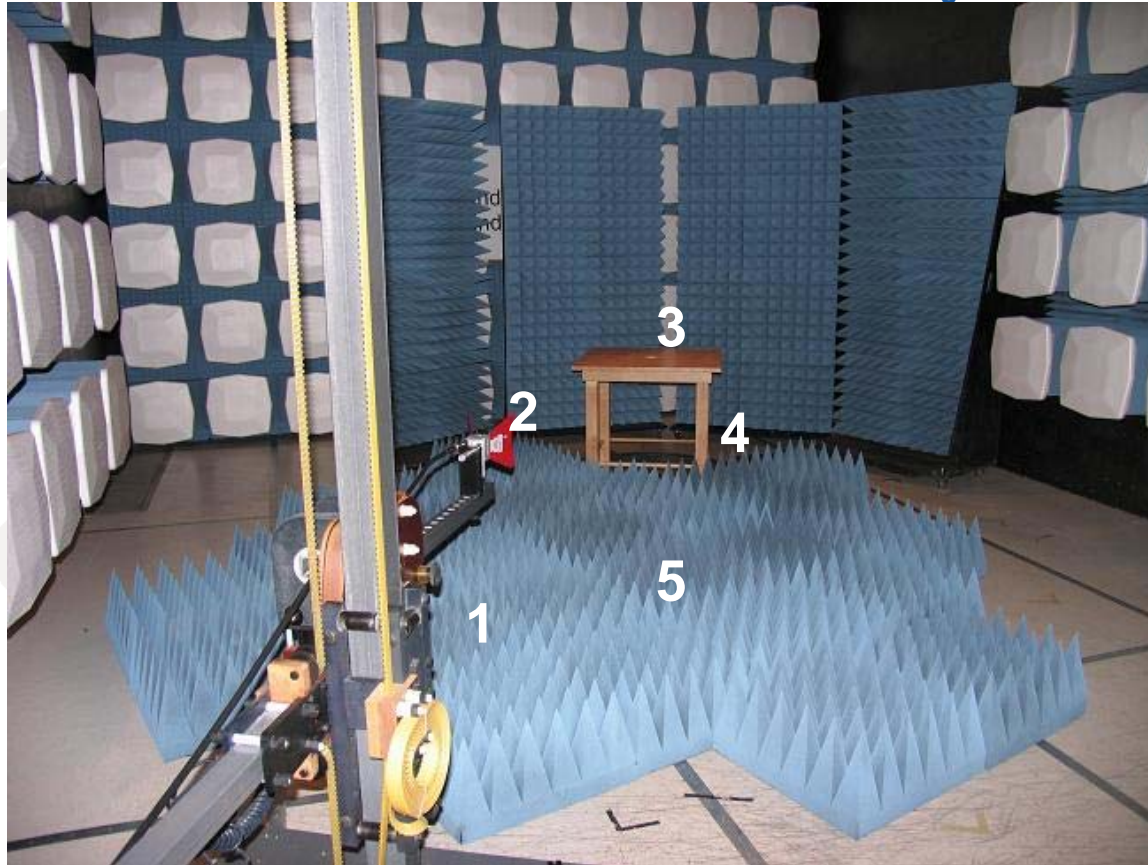
- Oscilloscope
- Power Divider
- Power Meter
- Power Sensor
- Preamplifier
- Radio Communications Analyzer
- Semi-Anechoic Chamber (SAC)
- Shielded Room
- Signal Generator
- Spectrum Analyzer
- Test Receiver
- Turntable



Semi Anechoic Chamber



Radiated setup below 1GHz



Radiated setup above 1GHz



Open Area Test Site



Wireline Test Lab

- AC Power Source Analyzers
- Dielectric Withstand Tester
- Differential Probe
- DSLAM
- Feeding boxes
- Feeding Bridge
- Function Generators
- Function/Arbitrary Wave Form Generator



XDSL/POTS Test setup



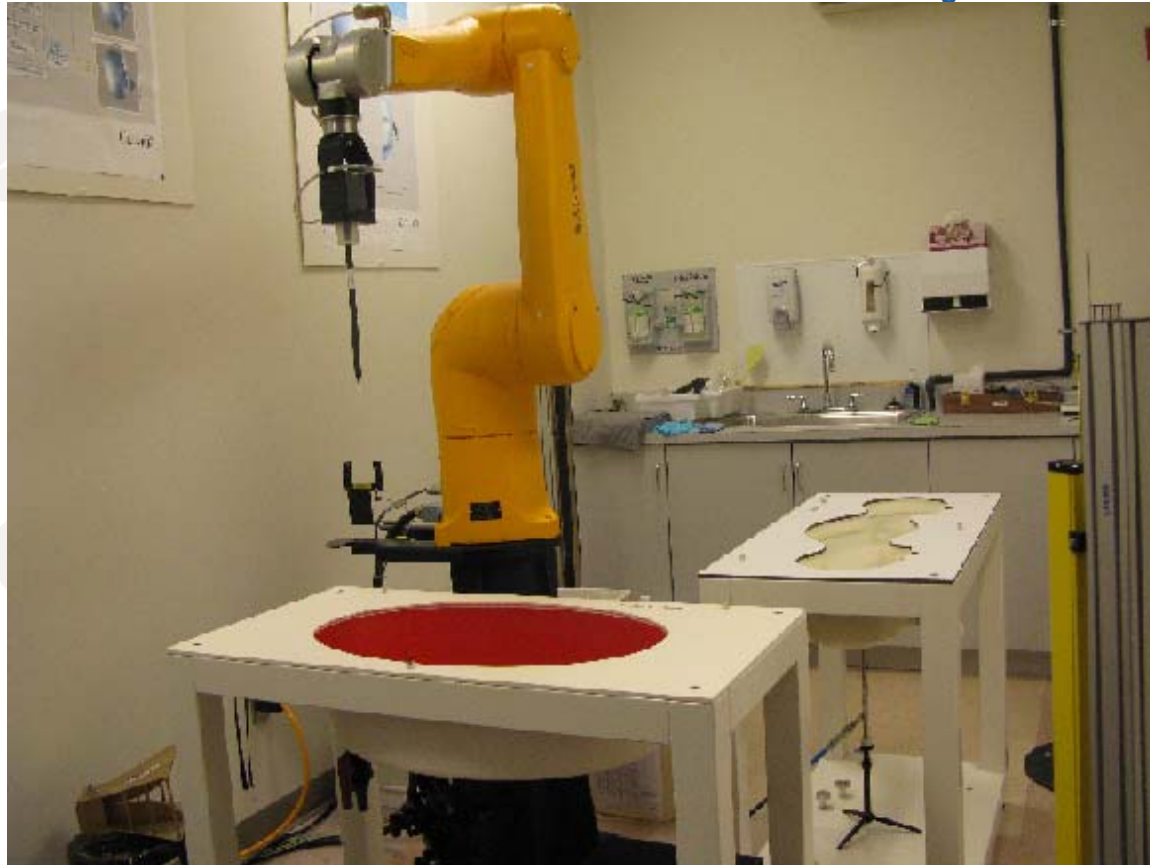
Wireline Test Lab (contd)

- HAC Probe-Axial
- HAC Probe-Radial
- Head and Torso Simulator (HATS)
- Line Simulator
- Longitudinal Test Circuit
- Multimeters
- Surge & EFT Couple
- Surge Network
- Switch/ Control System
- Transverse Balance Circuit Box
- Vector Signal Analyzers (VNA)



SAR Test Lab

- Amplifiers
- Analog Signal Generator
- Attenuators (3 dB, 10 dB, 20 dB)
- Data Acquisition Electronics
- Dielectric Probe Kit
- Dual Directional Coupler
- Isotropic E-Field Probe
- Power Meter
- Power Sensors
- Radio Communication Analyzer
- Reference Dipole Antennas
- SAR Compliance Test System
- Signal Generators
- Tissues Simulating Liquid (TSL)



SAR Lab partial view



Flat Phantom housing



Calibration Lab partial view



Thank you

Any Questions ?

Bill McCrum

Consultant

Telecommunication Standardization

Bureau

tsbworkshops@itu.int