

Conformance assessment methods to combat counterfeit mobile phones, ITU-D Workshop

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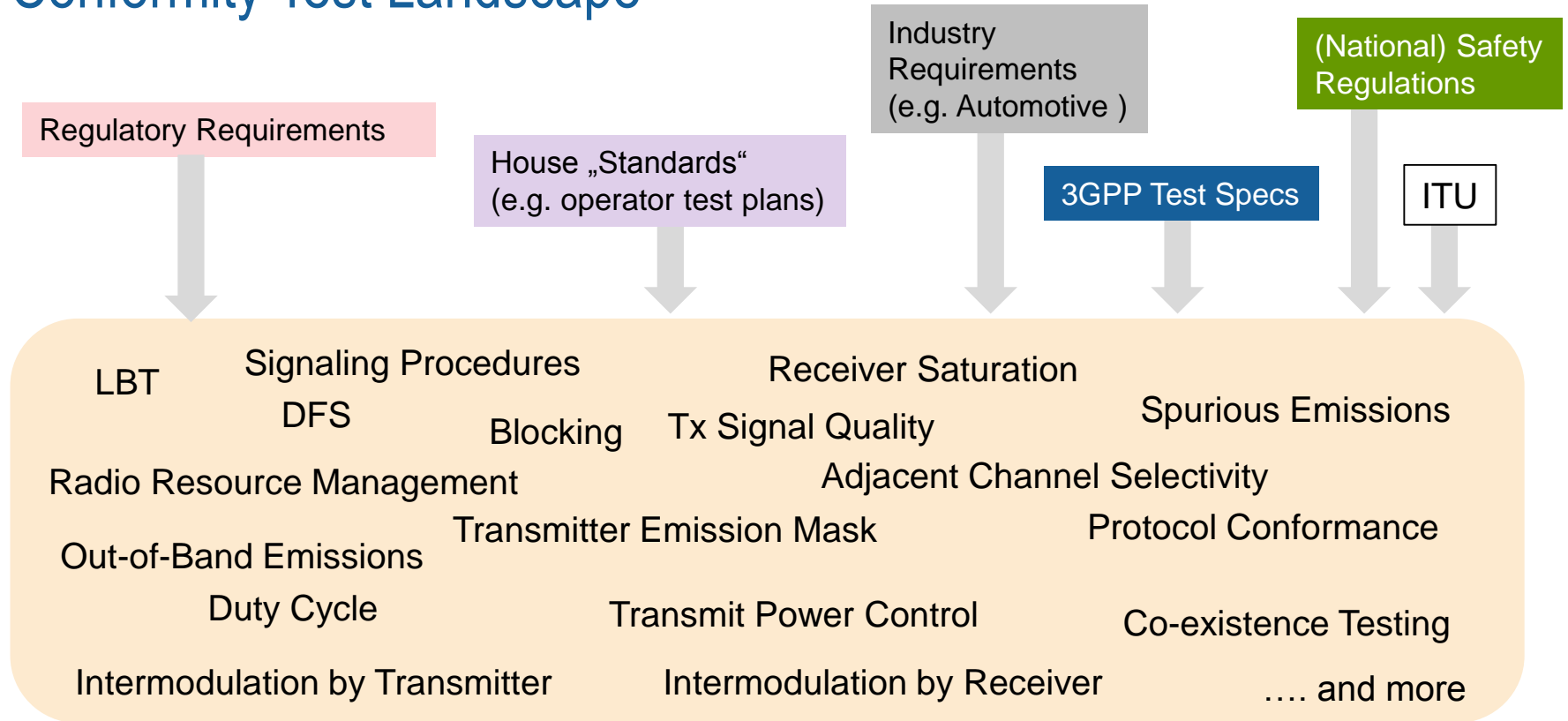
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Conformity Test Landscape



Basic Conformity Areas for Mobile Phones

- EMC/EMI Conformance
- Radio Transmission and Reception Conformance
- Protocol Conformance
- Radio Resource Management
- OTA (Over The Air) Performance Testing
- RF Exposure Conformance
- Power consumption requirements
- Location Based Services / Emergency call
- *Application Testing*



Conformity Assessment for Mobile Phones

- Regulatory Requirements / Market Introduction
 - RED (Radio Equipment Directive), EC Europe
 - MIC, Japan
 - FCC, USA
 - ...
- Industry Certification Groups
 - GCF (Global Certification Forum)
 - PTCRB
- Operator Test Plans and Network Approval



Problems with Counterfeit Mobile Phones

- Low RF performance
- Unwanted Emissions
- Poor/Wrong Antenna Design
- Faulty or outdated protocol implementation
- Heating / Battery safety
- Missing RF Exposure measures
- Wrong Cell and Parameter Reporting
- Identity (IMEI Duplication)



EMC/EMI Conformance

- Main topic is the conformance assessment for Unwanted Emission
 - Basic Requirements → ITU Recommendation SM.329
 - National Regulation
 - Radiated Requirement and Test
- Focus: Disturbance of other services
 - Not a metric for the service performance of a device
- Often the only coverage in tests for admission to a local market



Conformance for radio transmission and reception / OTA performance

- Radio transmission and reception conformance defines the minimum RF characteristics and minimum performance requirements for mobile phones.
- Typical parameters are:
 - Maximum Transmission Power / Power dynamics
 - Unwanted Emissions
 - Modulation Quality
 - Receiver Sensitivity
 - Demodulation and Throughput Performance
- OTA performance includes the performance of the antenna of the device (Tx and Rx)
 - Total Radiated Power
 - Total Integrated Sensitivity
 - Overview in ITU-T contribution T17-SG11-C-0174



Radio Resource Management Conformance

- Testing of Timing and Signaling Characteristics, Reporting Procedures and Accuracy, Mobility Control
- RRM Testing qualifies the ability of a mobile device to efficiently use the network configuration in terms of mobility and measurement reporting.
- Essential for the general performance in mobility scenarios like cell and technology handover
- Fundamental performance requirement if mobile phone reporting parameter are used in self organizing networks



Protocol Conformance

- Protocol and signaling conformance testing checks the conformant implementation of the radio protocol.
- Usually this is designed that the different test purposes per radio layer and the relevant procedures are tested.

- Essential for correct protocol function with the network
 - Transport Format Selection
 - Priority Handling
 - Data Transfer (ARQ Function)
 - Security
 - NAS (Non Access Stratum) procedures
 -

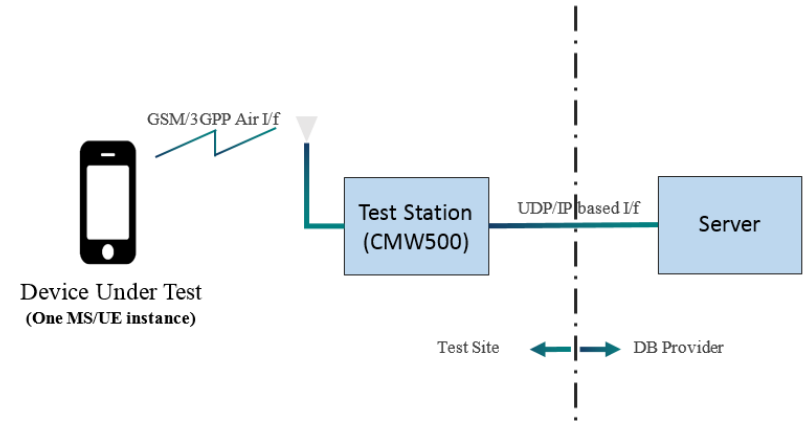
- Example of a LTE RRC (Radio Resource Control) procedure
 - TC 9.1.4.2 „Identification procedure, IMEI requested“ *

* as per ETSI TS136.523-1



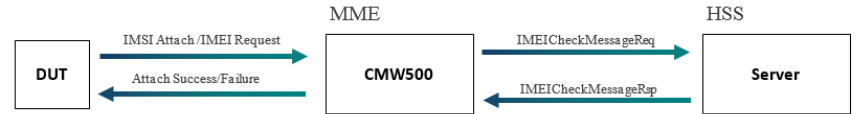
IMEI verification

- IMEI procedure as per 3GPP air interface
 - GSM/WCDMA/TD-SCDMA/LTE
- Independent of network operator
 - Operation with Test-UICC
- Automation possible – Connection to IMEI Database



Interaction Scenarios

Registration / Initial Attach / IMEI Request





Thank you.

