



AFRICAN ADVANCED LEVEL TELECOMMUNICATIONS INSTITUTE (AFRALTI)

## TRAINING WORKSHOP OUTLINE

<b>TITLE:</b>	<b>HSPA/LTE NETWORK PLANNING</b>
<b>DATES:</b>	<b>22-26 FEBRUARY 2016</b>
<b>VENUE:</b>	<b>NYANGA, ZIMBABWE</b>
<b>COURSE FEE:</b>	<b>AFRALTI MEMBER USD1,200, NON-MEMBER USD1,440</b>

### Course Overview:

The workshop will explore key areas including:

The HSPA/LTE network planning covering detailed description of the LTE radio interface and procedures; MIMO technologies in 3GPP LTE and LTE-Advanced, the different Multiple input multiple outputs (MIMO) Technologies. The LTE system Architecture and Protocols, HSPA/LTE spectrum planning me, the standard FDD and TDD bands allocated for HSPA/LTE; Presentation of the main challenges in adoption and deployment of HSPA/LTE networks, . LTE ecosystems including the main equipment suppliers devices .

The Key technology & business drivers, including: higher spectral efficiency, all - IP network, Self Organizing Network (SON), Multiple - Input Multiple - Output (MIMO), high spectrum flexibility and scalability, high peak data rates, low latency, network sharing, lower costs per bits, improved user quality of experience. Principles, motivations, and key requirements for LTE; overview of LTE releases 8, 9, and 10.

### Target Audience:

- Senior and middle level business and technical managers working for mobile operators and other ICT service providers
- ICT regulators and policy makers
- Equipment vendors
- ICT consultants and analysts.

### Pre-requisite/s:

Knowledge/ working experience in ICT/Telecommunications, specifically in cellular mobile industry including operators, regulators, consultants and academia.

## **Pain Points:**

- Challenges in planning and implementation of HSPA/LTE networks
- Identifying and assessment of the appropriated HSPA/LTE technologies
- Challenges of planning and deployment of PDSDA/LTE networks cost effectively
- Designing Regulatory practices on HSPA/LTE Service Delivery

## **Value Proposition:**

- To help Operators overcome their challenges with HSPA/LTE requirements
- To enable Regulators adapt to existing and emerging HSPA/LTE challenges
- To enhance the professional knowledge of Operators and Regulators to enable broadening of their skills in the complex evolution to HSPA/LTE

## **Methodology:**

Lectures, PowerPoint Presentations, Interactive Discussions, Cases Studies

## **Workshop Objectives:**

Participants to the HSPA/LTE Network Planning Workshop will get an understanding of the benefits and challenges offered by LTE so that they will be in the position to:

- Understand the HSPA/LTE network components and functions;
- Understand the HSPA/LTE network planning procedures
- Understand the current state of the LTE ecosystem and service offerings;
- Determine the available HSPA/LTE options in terms of spectrum, equipment availability, timeline, evolution from 3G
- Optimize their /HSPA/LTE strategy, based on LTE current & future capabilities;
- Understand all areas of their business that will be affected by HSPA/LTE;

## **Workshop Learning Outcomes:**

At the end of the five days training, participants will:

- ✓ Have understood the HSPA/LTE Network Planning techniques.
- ✓ Have understood effective analysis of HSPA/LTE network performance against regulatory-set targets.
- ✓ Be in a position to initiate an educated dialog with equipment vendors and service providers on procurement initiatives
- ✓ Be in a position to plan and deploy HSPA/LTE networks
- ✓ Be in a position to effectively implement HSPA/LTE networks.

## **Workshop Contents/Topics:**

### **1. Introduction**

- a. 2G>EDGE>3G>HSPA>LTE>4G>NGN Overview
- b. 3GPP Standards Specifications
- c. LTE Standards Evolution
- d. Basic Concepts of LTE
- e. Key Drivers of LTE and LTE-A

- 2. LTE Challenges/Solutions**
  - a. Spectrum Availability
  - b. Device Availability
  - c. Voice Support and Roaming
  - d. Integration with 2/3G and other networks
  - e. Data Pricing
  - f. Backhaul Linkages
- 3. LTE Key Features**
  - a. Spectrum Flexibility
  - b. Frequency Selective Fading
  - c. Multiple-Access Schemes
  - d. Multi-Antenna Techniques
  - e. Generic Frame Structure
- 4. LTE Spectrum Planning**
  - a. Standard LTE Bands
  - b. Digital Dividend Bands
  - c. Prime LTE Bands
  - d. Re-Farming Bands
  - e. WRC-15 Band Allocations
- 5. LTE Channel Planning**
  - a. Bandwidth Scalability
  - b. LTE Downlink Channels
  - c. LTE Uplink Channels
- 6. LTE Network Architecture**
  - a. E-UTRAN
  - b. Evolved Packet Core (EPC)
  - c. System Architecture Evolution (SAE)
  - d. Physical Layers Procedures
  - e. Multi-Antenna Techniques
- 7. LTE Radio Interface**
  - a. OFDMA Vs. SC-FDMA Overview
  - b. Adaptive Modulation and Coding
  - c. LTE Resource Grids
  - d. LTE Bandwidth Resource Configuration
  - e. LTE Uplink and Downlink Channels
  - f. LTE Protocol
- 8. MIMO Planning**
  - a. Multi-Antenna Techniques
  - b. Beam Forming
  - c. Antenna Configurations
- 9. LTE-A- Key Features**
  - a. Asymmetric Transmission Bandwidth
  - b. Layered OFDMA Modulation
  - c. Advanced Multi-Cell Transmission-Reception Techniques
  - d. Enhanced Multi-Antenna Transmission Techniques
  - e. Support of Larger Bandwidth in LTE-Advanced

- 10. LTE Network Planning**
  - a. Performance
  - b. LTE QoS
  - c. Radio Planning Tools
  - d. BWA Planning Process
  - e. ITU validation Process for Planning Tools
- 11. LTE QoS Planning**
  - a. Performance Requirements
  - b. End User Expectations
  - c. Bearer Architecture
  - d. Functional Architecture
- 12. Self Organising Network Planning**
  - a. Self-Configuration
  - b. Self-Optimization
  - c. Self-Maintenance
- 13. BWA Planning Strategies**
  - a. Network Evolution Factors
  - b. Long-term/Strategic Network Planning
  - c. Application of WT/ICT Indicators in NGN Planning
  - d. Evaluation of LTE User Potential
  - e. Evaluation of NGN User Potential
- 14. LTE-2G/3G Interworking Planning**
  - a. 2G Interworking
  - b. 3G Interworking
- 15. LTE Network Sharing Planning**
  - a. Roaming Sharing
  - b. Active Sharing
  - c. Passive Sharing
  - d. Management of shared networks
- 16. LTE Deployment Scenarios Planning**
  - a. Service Deployment
  - b. Network Deployment
- 17. LTE Deployment Status**
  - a. Use Subscriptions
  - b. Networks
  - c. Equipment Vendors
  - d. Devices
- 18. LTE Strategic Planning**
  - a. Technology Alternatives for NGN Access
  - b. Future HSPA/LTE Indicators Forecast

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