

Training Proposal for LTE Product Technical Training Project



HUAWEI
HUAWEI Learning Service
2015

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1 Training Solution

1.1 Required Training Programs

For this project, the whole training solution is designed into the following programs:

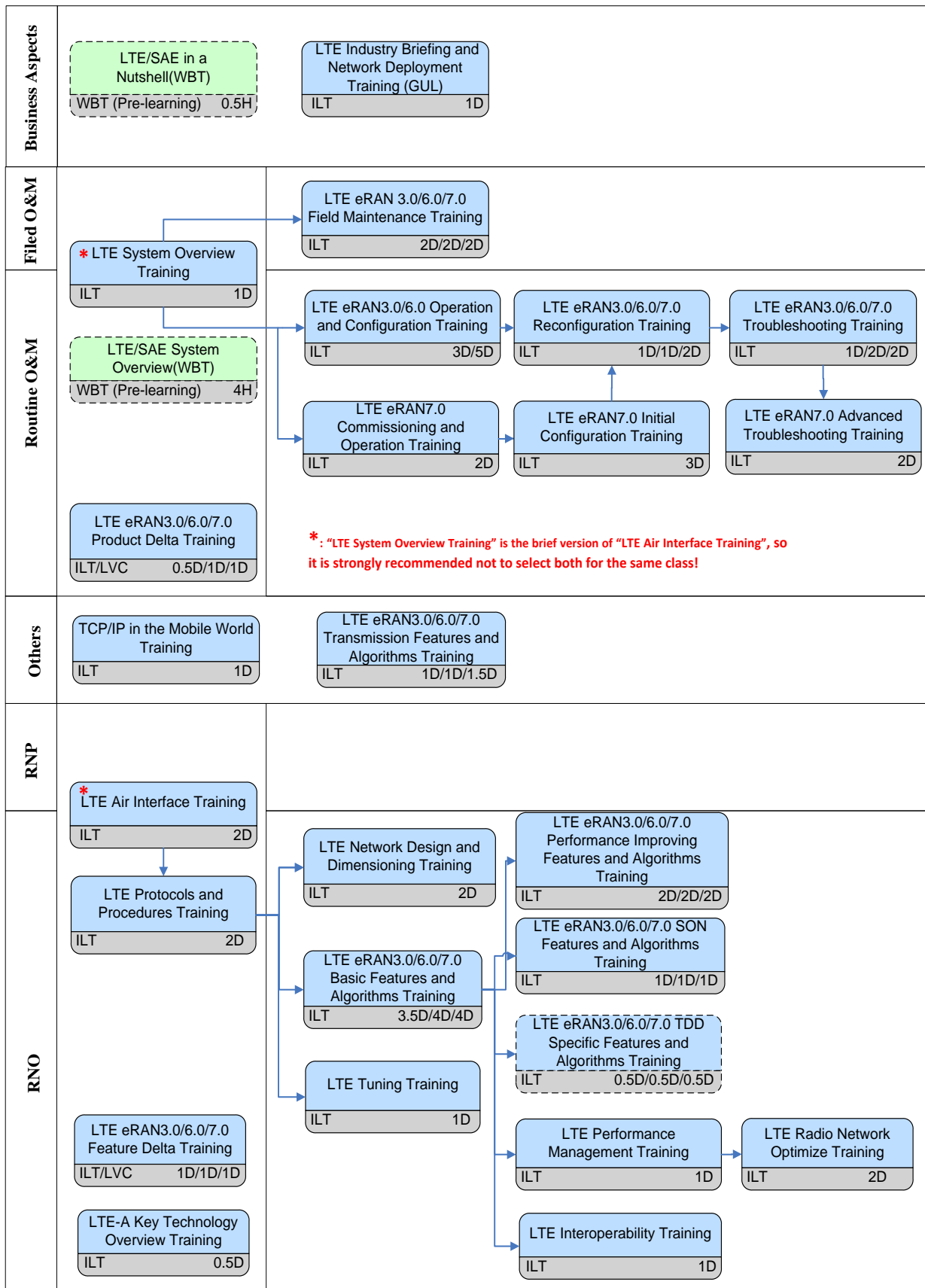
Training Program	Program Level	Duration (workdays)	Training Location	Class Size
Principle				
LTE Industry Briefing and Network Deployment Training(GUL)	II	1		6 ~ 12
LTE System Overview Training	I	1		6 ~ 12
LTE Air Interface Training	II	2		6 ~ 12
LTE Protocol and Procedure Training	II	2		6 ~ 12
LTE-A Key Technology Overview Training	II	0.5		6 ~ 12
TCP/IP in the Mobile World Training	II	1		6 ~ 12
Product				
LTE eRAN3.0 Field Maintenance Training	I	2		6 ~ 12
LTE eRAN3.0 Operation and Configuration Training	II	3		6 ~ 12
LTE eRAN3.0 Reconfiguration Training	II	1		6 ~ 12
LTE eRAN3.0 Troubleshooting Training	II	1		6 ~ 12
LTE eRAN3.0 Product Delta Training	III	1		6 ~ 12
LTE eRAN3.0 Transmission Features and Algorithms Training	III	1		6 ~ 12
LTE eRAN6.0 Field Maintenance Training	I	2		6 ~ 12
LTE eRAN6.0 Operation and Configuration Training	II	5		6 ~ 12
LTE eRAN6.0 Reconfiguration Training	II	1		6 ~ 12
LTE eRAN6.0 Troubleshooting Training	II	2		6 ~ 12
LTE eRAN6.0 Product Delta Training	III	1		6 ~ 12
LTE eRAN6.0 Transmission Features and Algorithms Training	III	1		6 ~ 12

LTE eRAN7.0 Field Maintenance Training	I	2		6 ~ 12
LTE eRAN7.0 Commissioning and Operation Training	II	2		6 ~ 12
LTE eRAN7.0 Initial Configuration Training	II	3		6 ~ 12
LTE eRAN7.0 Reconfiguration Training	II	2		6 ~ 12
LTE eRAN7.0 Troubleshooting Training	II	2		6 ~ 12
LTE eRAN7.0 Advanced Troubleshooting Training	III	2		6 ~ 12
LTE eRAN7.0 Product Delta Training	III	1		6 ~ 12
LTE eRAN7.0 Transmission Features and Algorithms Training	III	1.5		6 ~ 12
RNP				
LTE Network Design and Dimensioning Training	III	2		6 ~ 12
RNO				
LTE eRAN3.0 Feature Delta Training	III	1		6 ~ 12
LTE eRAN3.0 Basic Features and Algorithms Training	III	3.5		6 ~ 12
LTE eRAN3.0 SON Features and Algorithms Training	III	1		6 ~ 12
LTE eRAN3.0 TDD Specific Features and Algorithms Training	III	0.5		6 ~ 12
LTE eRAN3.0 Performance Improving Features and Algorithms Training	III	2		6 ~ 12
LTE eRAN6.0 Feature Delta Training	III	1		6 ~ 12
LTE eRAN6.0 Basic Features and Algorithms Training	III	4		6 ~ 12
LTE eRAN6.0 SON Features and Algorithms Training	III	1		6 ~ 12
LTE eRAN6.0 TDD Specific Features and Algorithms Training	III	0.5		6 ~ 12
LTE eRAN6.0 Performance Improving Features and Algorithms Training	III	2		6 ~ 12
LTE eRAN7.0 Feature Delta Training	III	1		6 ~ 12
LTE eRAN7.0 Basic Features and Algorithms Training	III	4		6 ~ 12
LTE eRAN7.0 SON Features and Algorithms Training	III	1		6 ~ 12
LTE eRAN7.0 TDD Specific Features and Algorithms Training	III	0.5		6 ~ 12

LTE eRAN7.0 Performance Improving Features and Algorithms Training	III	2		6 ~ 12
LTE Tuning Training	III	1		6 ~ 12
LTE Performance Management Training	III	1		6 ~ 12
LTE Radio Network Optimize Training	IV	2		6 ~ 12
LTE Interoperability Training	IV	1		6 ~ 12
WBT				
LTE SAE System Overview	I	4H		
LTE in a Nutshell	I	0.5H		

Level Description: I : Basic Course II : Intermediate Course III: Advanced Course IV: Expert Course

1.2 LTE Product Technical Training Path



1.3 Principle

1.3.1 LTE Industry Briefing and Network Deployment Training(GUL)

Training Path

LTE Industry Briefing and Network Deployment (GUL)		
OEA11	Lecture	1d

Target Audience

Business Developer

Prerequisites

- A general knowledge in cellular systems and radio technology

Objectives

On completion of this program, the participants will be able to:

- Outline Incentive of LTE
- Describe various services and trends provided by LTE
- Overview evolution of radio technologies
- Describe network architecture of EPS(E-UTRAN and EPC)
- Explain key technologies of LTE, such as OFDM/SC-FDM, MIMO
- Brief LTE industry chain development
- Outline LTE overall network evolution deployment scenario such as interoperability strategy, voice strategy etc.

Training Content

OEA11 LTE Industry Briefing and Network Deployment (GUL)

- LTE Industry Briefing and Network Deployment (GUL)
 - Incentive of LTE
 - Services of LTE
 - LTE Key Technologies
 - Evolution of Radio Technologies
 - LTE Network Architecture
 - OFDM Technologies
 - MIMO Technologies
 - SON Technologies
 - LTE Industry Chain Development
 - LTE Radio Network Evolution Deployment
 - LTE Core Network Evolution Deployment
 - LTE Transmission Network Evolution Deployment

Duration

1 working day

Class Size

Min 6, Max 12

1.3.2 LTE System Overview Training

Training Path

LTE System Overview		
OEA03	Lecture	1d

Target Audience

Field Technician
Service Technician
System Technician
Network Deployment Engineer
Service Engineer
Service Design Engineer
Service Planning Engineer
System Engineer

Prerequisites

- A general knowledge in cellular systems and radio technology

Objectives

On completion of this program, the participants will be able to:

- Describe the evolution of cellular networks
- Summarize the evolution of 3GPP releases
- Explain the logical architecture of EPS (E-UTRAN and EPC)
- Give an overview of the interfaces in EPS
- Describe the Evolved Packet Core (EPC)
- Describe the role of the MME and the S-GW
- Describe the S1, X2 and radio-interface and their protocol stacks
- Describe the radio interface techniques used in uplink and downlink
- Describe the channel structure of the radio interface
- Describe the time-domain and Frequency-domain structure in the radio interface in UL and DL for both FDD and TDD mode
- Have a good understanding of the OFDM principle, signal generation and processing
- Detail the reference symbols in DL
- Describe MIMO technology
- Have a good understanding of the SC-FDMA principle, signal generation and processing
- Describe Huawei eNodeB Family
- Describe Huawei LTE products and application scenarios
- Describe Huawei LTE products Operation and Maintenance System

Training Content

OEA03 LTE System Overview

- LTE System Overview
 - Network Architecture
 - Evolution of Cellular Networks
 - 3GPP Releases
 - E-UTRAN Architecture
 - E-UTRAN Interfaces and Protocols
 - EPC Architecture
 - EPC Interfaces and Protocols
 - LTE Air Interface Principles
 - Radio Interface Techniques
 - Principles of OFDM
 - LTE Channel Structures
 - LTE Frame Structure
 - Downlink OFDMA
 - Uplink SC-FDMA
 - Multiple Input Multiple Output
 - Multimedia Broadcast Multicast Service
 - eNodeB Product Overview
 - The Huawei eNodeB family
 - Products and application scenarios
 - Operation and Maintenance

Duration

1 working day

Class Size

Min 6, Max 12

1.3.3 LTE Air Interface Training

Training Path

LTE Air Interface		
OEA04	Lecture	2d

Target Audience

Service Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Attendees should have a general knowledge in cellular systems and radio technology.

Objectives

On completion of this program, the participants will be able to:

- Describe the evolution of cellular networks
- Summarize the evolution of 3GPP releases
- Describe the radio interface techniques
- Explain the difference between the FDD and TDD mode
- Describe the flexible spectrum usage
- Outline the concepts of channel coding
- Describe the principle for OFDM
- Have a good understanding of the OFDMA/SC-FDMA principle, signal generation and processing
- Explain the pros and cons with OFDMA and SC-FDMA
- Outline the radio interface protocols
- Detail the time-domain and frequency-domain structure in the radio interface in UL and DL for both FDD and TDD mode
- Detail the channel structure of the radio interface
- Detail the frame structure of the radio interface
- Describe the uplink/downlink physical signals
- Detail the uplink/downlink control signaling and formats
- Detail the uplink/downlink reference symbols
- Detail the uplink/downlink transmission technique
- Detail the paging procedures
- Explain the cell search procedure
- Detail the random access procedure
- Describe the uplink/downlink power control
- Explain HARQ
- Describe the concepts of layers, channel rank, spatial multiplexing, open and closed loop

spatial multiplexing, TX diversity, beamforming, SU-MIMO and MU-MIMO

Training Content

OEA04 LTE Air Interface

- LTE Air Interface
 - The evolution of cellular networks
 - The evolution of 3GPP releases
 - Radio interface techniques
 - Difference between the FDD and TDD mode
 - Flexible spectrum usage
 - Concepts of channel coding
 - Principle for OFDM
 - OFDMA/SC-FDMA principle, signal generation and processing
 - Pros and cons with OFDMA and SC-FDMA
 - Radio interface protocols
 - Time-domain and frequency-domain structure in the radio interface in UL and DL for both FDD and TDD mode
 - Channel structure of the radio interface
 - Frame structure of the radio interface
 - Uplink/downlink physical signals
 - Uplink/downlink control signaling and formats
 - Uplink/downlink reference symbols
 - Uplink/downlink transmission technique
 - The paging procedure
 - The cell search procedure
 - The random access procedure
 - Uplink/downlink power controls
 - HARQ
 - Concepts of layers, channel rank, spatial multiplexing, open and closed loop spatial multiplexing, TX diversity, beamforming, SU-MIMO and MU-MIMO

Duration

2 working days

Class Size

Min 6, Max 12

1.3.4 LTE Protocols and Procedures Training

Training Path

LTE Protocols and Procedures		
OEA15	Lecture, Lab, Demo	2d

Target Audience

Service Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses::
- LTE Air Interface

Objectives

On completion of this program, the participants will be able to:

- Describe the evolution of cellular networks
- Explain the main functions of EPS network element
- List the interfaces in EPS and the protocol of EPS interfaces
- Explain how signaling takes place between the UE and the EPC
- Brief the main functions of Non Access Stratum(NAS), Radio Resource Control (RRC), Packet Data Convergence Protocol (PDCP) Radio Link Control (RLC), Medium Access Control (MAC), the physical layer and their relations
- Explain the purpose of EPS Bearer Services and eUTRA Radio Bearer
- Explain the concept, principle and signaling flow of typical procedure, such as UE access procedure, paging, TAU, handover etc.

Training Content

OEA15 LTE Protocols and Procedures

- LTE Protocols and Procedures
 - The evolution of cellular networks
 - EPS network element
 - EPS interfaces
 - The main functions of Non Access Stratum(NAS), Radio Resource Control (RRC), Packet Data Convergence Protocol (PDCP) Radio Link Control (RLC), Medium Access Control (MAC), the physical layer and their relations
 - EPS Bearer Services and eUTRA Radio Bearer
 - The concept, principle and signaling procedure of UE access network
 - The concept, principle and signaling procedure of default bearer
 - The concept, principle and signaling procedure of special bearer

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- The concept, principle and signaling procedure of paging
 - The concept, principle and signaling procedure of TAU
 - The concept, principle and signaling procedure of Handover
 - The concept, principle and signaling procedure of detach

Duration

2 working days

Class Size

Min 6, Max 12

1.3.5 LTE-A Key Technology Overview Training

Training Path

LTE-A Key Technology Overview		
OE002	Lecture	0.5d

Target Audience

Service Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE System Overview
- LTE Air Interface
- LTE eRAN3.0/6.0/7.0 Features and Algorithms

Objectives

On completion of this program, the participants will be able to:

- Describe LTE Describe -A requirements and 3GPP schedule
- Describe benefit and principle of LTE-A key technology
- Huawei LTE-A cases study

Training Content

OEA53 LTE-A Key Technology Overview

- LTE-A Key Technology Overview
 - LTE-A requirements and 3GPP schedule
 - Benefit and principle of CA(Carrier Aggregation)
 - Benefit and principle of high order MIMO
 - Benefit and principle of CoMP (Coordinated Multi-Point transmission/reception technology)
 - Benefit and principle of eICIC (Inter-Cell Interference Coordination)
 - HetNet concept introduction
 - LTE-A application cases

Duration

0.5 working day

Class Size

Min 6, Max 12

1.3.6 TCP/IP in the Mobile World Training

Training Path

TCP/IP in the Mobile World		
OEA07	Lecture	1d

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- A general knowledge in cellular systems and radio technology

Objectives

On completion of this program, the participants will be able to:

- Learn about IP protocol release specifications and common RFC standards
- Learn about common IP RAN concepts such as the MSTP and PTN
- Understand the TCP/IP protocol structure, and learn common technologies such as the VLAN and DSCP
- Learn the protocol stack composition on IP RAN interfaces
- Learn the IP components, and understand the data exchange process
- Be familiar with common IP RAN devices and maintenance applications
- Learn about differences among the IP, ATM, and TDM technologies, and problems caused by IP-based networking

Training Content

OEA07 TCP/IP in the Mobile World

- TCP/IP in the Mobile World
 - IP protocol origin
 - IP network topology structure
 - OSI model and TCP/IP protocol structure
 - IP address Introduction
 - IP subnet division and Exchange Foundation
 - IP ATM, TDM comparison
- TCP/IP in the Mobile World Student Book

Duration

1 working day

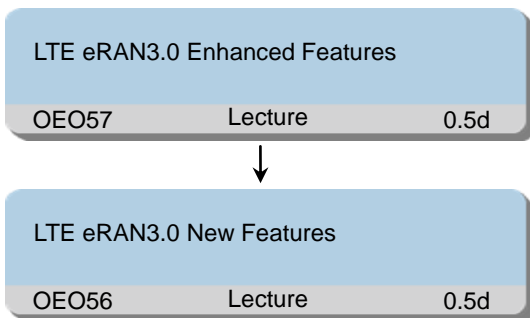
Class Size

Min 6, Max 12

1.4 RNO

1.4.1 LTE eRAN3.0 Feature Delta Training

Training Path



Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE Air Interface
- LTE Protocols and Procedures
- LTE eRAN2.1/2.2 Features and Algorithms

Objectives

On completion of this program, the participants will be able to:

- Describe enhanced and new functions in Handover Feature from eRAN2.1/2.2 to eRAN3.0
- Introduce enhanced functions in RAN Sharing(Optional)
- Outline new functions in CSFB Feature in eRAN3.0
- Explain UL CoMP Feature in eRAN3.0
- Describe 800M self-interference cancellation in eRAN3.0(Optional)

Training Content

OEO57 LTE eRAN3.0 Enhanced Features

- LTE eRAN3.0 Enhanced Features
 - LTE eRAN3.0 Handover Feature
 - Coverage Based Inter-frequency Handover
 - Handover Based on SPID
 - LTE eRAN3.0 RAN Sharing Feature(Optional according to the practical network)
 - RAN Sharing with Common Carrier

OEO56 LTE eRAN3.0 New Features

- LTE eRAN3.0 New Features

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- LTE eRAN3.0 Handover Feature
 - Distance Based Inter-frequency Handover
 - Service Based Inter-frequency Handover
 - Distance based Inter-RAT handover to UTRAN
 - Distance based Inter-RAT handover to GERAN
 - E-UTRAN to UTRAN CS/PS Steering
 - LTE eRAN3.0 CS Fallback Feature
 - CS Fallback with LAI to UTRAN
 - CS Fallback with LAI to GERAN
 - LTE eRAN3.0 UL CoMP feature
 - Benefit of UL CoMP feature
 - Application scenario of UL CoMP feature
 - LTE eRAN3.0 800M self-interference cancellation (Optimal according to the practical network)
 - Introduce of self interference
 - Application scenarios
 - Technologies for self - interference cancellation

Duration

1 working day

Class Size

Min 6, Max 12

1.4.2 LTE eRAN3.0 Basic Features and Algorithms Training

Training Path

LTE eRAN3.0 Basic Features and Algorithms		
OEO51	Lecture	3.5d

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE Air Interface
- LTE Protocols and Procedures

Objectives

On completion of this program, the participants will be able to:

- Outline idle mode
- Describe PLMN selection
- Describe cell selection and cell reselection
- Config cell selection
- Config cell reselection measurement
- Describe system information reception
- Config SIB
- Describe tracking area registration
- Describe paging monitoring procedure
- Outline mobility management
- Describe intra-frequency handover
- Describe inter-frequency handover
- Describe inter-rat handover
- Set measurement configuration
- Set handover related parameters
- Outline power control
- Describe downlink power control
- Describe uplink power control
- Set initial power
- Outline scheduling

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- Describe downlink scheduling
 - Describe uplink scheduling
 - Describe scheduling deployment strategy
 - Describe basic principles of QoS management
 - Describe QoS management policies
 - Describe QoS management methods
 - List when to use QoS management
 - Outline MIMO feature
 - Describe multiple-antenna reception/ transmission MIMO
 - Describe multiple-antenna transmission MIMO
 - Describe adaptive mode selection and switching of MIMO
 - Set adaptive MIMO
 - Describe PDCCH/PUCCH resource management feature
 - parameters
 - Outline LTE voice solutions
 - Outline CS Fallback
 - Describe CS Fallback procedure
 - Draw network architecture for CS Fallback to UTRAN/GERAN
 - Describe CS Fallback to UTRAN/GERAN
 - Select CS Fallback mechanisms
 - Perform configuration on eNodeB for CS Fallback

Training Content

OEO51 LTE eRAN3.0 Basic Features and Algorithms

- LTE eRAN3.0 Idle Mode Behavior
 - Idle Mode Overview
 - PLMN selection
 - Cell selection
 - Cell reselection
 - System information reception
 - Tracking area registration
 - Paging monitoring procedure
- LTE eRAN3.0 Power Control Feature
 - Power control overview
 - Downlink power control
 - Uplink power control
- LTE eRAN3.0 Scheduling Feature
 - Overview of Scheduling
 - Downlink Scheduling
 - Uplink Scheduling
 - Scheduling Deployment Strategy
- LTE eRAN3.0 Handover Feature

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- Mobility Management Overview
 - Intra-frequency Handover
 - Inter-frequency Handover
 - Inter-RAT Handover
 - LTE eRAN3.0 MIMO Feature
 - MIMO feature overview
 - Multiple-Antenna reception MIMO
 - Multiple-Antenna transmission MIMO
 - Adaptive mode selection and switching
 - LTE eRAN3.0 QoS Management Feature
 - Overview of QoS Management
 - QoS Management Policies
 - QoS Management Methods
 - When to Use QoS
 - LTE eRAN3.0 CS Fallback
 - CS Fallback Overview
 - LTE Voice Solution
 - CS Fallback Procedure
 - Network Architecture for CS Fallback to UTRAN/GERAN
 - Combined EPS/IMSI Attach Procedure
 - CS Fallback to UTRAN
 - CS Fallback Based on PS Redirection(UMTS)
 - CS Fallback Based on PS Handover(UMTS)
 - CS Fallback to GERAN
 - Decisions and Configuration of eNodeB in CS Fallback
 - Selection of CS Fallback Mechanisms
 - LTE eRAN3.0 Physical Channel Resource Management
 - PDCCH resource management
 - PDCCH symbols adaptively adjusted
 - CCE aggregation adaptively adjusted
 - DL/UL CCE ratio adaptively adjusted
 - PUCCH resource management
 - Adaptive SR period adjustment
 - Adaptive PUCCH resource adjustment

Duration

3.5 working days

Class Size

Min 6, Max 12

1.4.3 LTE eRAN3.0 SON Features and Algorithms Training

Training Path

LTE eRAN3.0 SON Features and Algorithms		
OEO52	Lecture	1d

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE Air Interface
- LTE Protocols and Procedures
- LTE eRAN3.0 Basic Features and Algorithms

Objectives

On completion of this program, the participants will be able to:

- Outline ANR overview
- Describe intra-RAT ANR management
- Describe inter-RAT ANR management
- Switch on ANR
- Set ANR related parameters
- Outline MRO processing flow
- List classification of intra-RAT MRO
- Describe intra-RAT MRO management
- Describe inter-RAT MRO management
- Set MRO to optimize handover
- Outline PCI conflict detection
- self-optimization overview
- Describe PCI conflict detection
- Describe PCI self-optimization in M2000
- Observe PCI conflict information
- Set PCI conflict detection
- Outline RACH optimization
- Describe prerequisites for RACH optimization
- Describe zero correlation zone configuration

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- Describe contention-based vs. contention-free random access
 - Describe RACH resource adjustment
 - Perform MML to deploy RACH optimization
 - Describe impact of RACH optimization
 - Outline cell outage detection
 - Describe sleeping cell detection techniques
 - Describe cell outage detection techniques
 - Deploy cell outage detection

Training Content

OEO52 LTE eRAN3.0 SON Features and Algorithms

- LTE eRAN3.0 SON Overview
 - Describe the SON benefits
 - Outline the SON functions
- SON Application in M2000 V200R012
 - Outline SON functions in M2000
 - Enable the SON switches in M2000
 - Check SON logs in M2000
- LTE eRAN3.0 ANR Feature
 - ANR Overview
 - Intra-RAT ANR Management
 - Inter-RAT ANR Management
- LTE eRAN3.0 MRO Feature
 - MRO Processing Flow
 - Classification of Intra-RAT MRO
 - Intra-RAT MRO Management
 - Inter-RAT MRO Management
- LTE eRAN3.0 PCI Conflict Detection#Self-Optimization
 - PCI Conflict Detection
 - Self-Optimization Overview
 - PCI Conflict Detection
 - PCI Self-Optimization in M2000
- LTE eRAN3.0 RACH Optimization
 - Overview of RACH Optimization
 - Prerequisites for RACH Optimization
 - Zero Correlation Zone Configuration
 - Contention-Based vs. Contention-Free Random Access
 - RACH Resource Adjustment
 - Dedicated Preamble Group Adjustment
 - Multiplexing of Dedicated Preambles
 - PRACH Configuration Index Adjustment
 - Adaptive Backoff

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- MML screenshots
 - Impact of RACH Optimization
 - LTE eRAN3.0 Cell Outage Detection
 - Overview of Cell Outage Detection
 - Sleeping Cell Detection Techniques
 - Cell Outage Detection Techniques
 - Engineering Guidelines

Duration

1 working day

Class Size

Min 6, Max 12

1.4.4 LTE eRAN3.0 TDD Specific Features and Algorithms Training

Training Path

LTE eRAN3.0 TDD Specific Features and Algorithms		
OEO53	Lecture	0.5d

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE Air Interface
- LTE Protocols and Procedures
- LTE eRAN3.0 Basic Features and Algorithms

Objectives

On completion of this program, the participants will be able to:

- Outline beamforming
- Describe beamforming-related concepts
- Describe beamforming principles and techniques
- Describe beamforming feature application scenarios
- Deploy beamforming
- Describe concept of sector, cell and TDD subframe configuration
- Draw TDD frame structure
- Describe uplink-downlink subframe configurations
- Describe configurations of special subframes
- Describe when to use subframe configuration
- Perform subframe configuration

Training Content

OEO53 LTE eRAN3.0 TDD Specific Features and Algorithms

- LTE eRAN3.0 Beamforming Feature
 - Overview of Beamforming
 - Beamforming-Related Concepts
 - Beamforming Principles and Techniques
 - Beamforming Feature Application Scenarios
 - Beamforming Deployment

-
- LTE eRAN3.0 Subframe Configuration Feature
 - Concept of Sector, cell and TDD Subframe Configuration
 - TDD Frame Structure
 - Uplink-Downlink Subframe Configurations
 - Configurations of Special Subframes
 - When to Use Subframe Configuration
 - Subframe Configuration Deployment

Duration

0.5 working day

Class Size

Min 6, Max 12

1.4.5 LTE eRAN3.0 Performance Improving Features and Algorithms Training

Training Path

LTE eRAN3.0 Performance Improving Features and Algorithms		
OEO54	Lecture	2d

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE Air Interface
- LTE Protocols and Procedures
- LTE eRAN3.0 Basic Features and Algorithms

Objectives

On completion of this program, the participants will be able to:

- Describe admission control
- Set admission control
- Describe congestion control
- Outline load monitoring
- Outline load balance
- Describe intra - frequency load balance
- Describe inter-frequency load balance
- Describe inter-RAT load balance
- Outline compact bandwidth
- Describe key technologies of compact bandwidth
- Describe related physical resource management
- Deploy compact bandwidth
- Outline UL CoMP
- Describe application scenarios of UL CoMP
- Describe key techniques for UL CoMP
- Describe related features of UL CoMP
- Deploy UL CoMP
- Outline ICIC
- Describe downlink ICIC

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- Describe uplink ICIC
 - Describe ICIC deployment strategy
 - Deploy ICIC
 - Outline principle and algorithm of RAN Sharing(Optional)

Training Content

OEO54 LTE eRAN3.0 Performance Improving Features and Algorithms

- LTE eRAN3.0 Admission and Congestion Control
 - Load Monitoring
 - Admission Control
 - Non-GBR Service Admission Control
 - GBR Service Admission Flow
 - QoS Satisfaction Rate Based Admission Control
 - Congestion Control
- LTE eRAN3.0 ICIC Feature
 - Overview of ICIC
 - Downlink ICIC
 - Uplink ICIC
 - ICIC Deployment Strategy
- LTE eRAN3.0 UL Comp
 - Benefit of UL CoMP
 - Principle for UL CoMP
 - Application scenario of UL CoMP
 - Engineering Guidelines of UL CoMP
- LTE eRAN3.0 Compact Bandwidth Feature
 - Overview of Compact Bandwidth
 - Key Technologies of Compact Bandwidth
 - Related Physical Resource Management
- LTE eRAN3.0 MLB Feature
 - Load Balance Overview
 - Intra - frequency Load Balance
 - Inter-frequency Load Balance
 - Inter - RAT Load Balance
- LTE eRAN3.0 RAN Sharing
 - Overview of RAN Sharing
 - RAN Sharing with Common Carriers
 - RAN Sharing with Dedicated Carriers
 - Engineering Guidelines of RAN Sharing

Duration

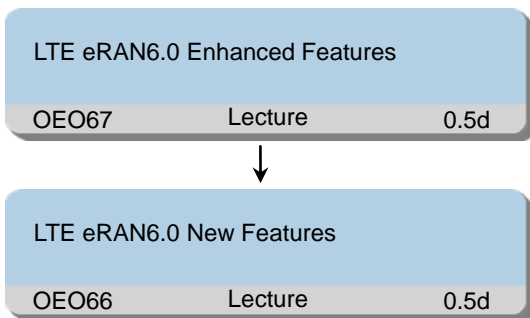
2 working days

Class Size

Min 6, Max 12

1.4.6 LTE eRAN6.0 Feature Delta Training

Training Path



Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE Air Interface
- LTE Protocols and Procedures
- LTE eRAN3.0 Features and Algorithms

Objectives

On completion of this program, the participants will be able to:

- Describe enhanced functions in Handover Feature from eRAN3.0 to eRAN6.0
- Describe enhanced and new functions in CS Fallback from eRAN3.0 to eRAN6.0
- Describe enhanced functions in Cell Outage Detection from eRAN3.0 to eRAN6.0
- Describe new functions in DRX and Signaling Control from eRAN3.0 to eRAN6.0
- Describe new features in eRAN6.0

Training Content

OEO67 LTE eRAN6.0 Enhanced Features

- LTE eRAN6.0 Enhanced Features
 - LTE eRAN6.0 Handover Feature
 - Coverage Based Inter-frequency/ Inter-RAT Handover
 - LTE eRAN6.0 CS Fallback
 - CS Fallback to UTRAN
 - Flash CS Fallback to UTRAN
 - Flash CS Fallback to GERAN
 - LTE eRAN6.0 Cell Outage Detection

- Detecting Sleeping Cell rapidly by eNodeB Audit Analysis

OEO66 LTE eRAN6.0 New Features

- LTE eRAN6.0 New Features
 - LTE eRAN6.0 CS Fallback
 - CS Fallback Steering to GERAN
 - CS Fallback Steering to UTRAN
 - LTE eRAN6.0 DRX and Signaling Control
 - Dynamic DRX
 - LTE eRAN6.0 Carrier Aggregation Feature
 - CA Basic Concepts and Principles
 - CA Feature Benefit and Influence
 - CA Feature Deployment and Configuration

Duration

1 working day

Class Size

Min 6, Max 12

1.4.7 LTE eRAN6.0 Basic Features and Algorithms Training

Training Path

LTE eRAN6.0 Basic Features and Algorithms		
OEO61	Lecture	4d

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE Air Interface
- LTE Protocols and Procedures

Objectives

On completion of this program, the participants will be able to:

- Outline idle mode
- Describe PLMN selection
- Describe cell selection and cell reselection
- Config cell selection
- Config cell reselection measurement
- Describe system information reception
- Config SIB
- Describe tracking area registration
- Describe paging monitoring procedure
- Outline mobility management
- Describe intra-frequency handover
- Describe inter-frequency handover
- Describe inter-rat handover
- Set measurement configuration
- Set handover related parameters
- Outline power control
- Describe downlink power control
- Describe uplink power control
- Set initial power
- Outline scheduling

-
- Describe downlink scheduling
 - Describe uplink scheduling
 - Describe scheduling deployment strategy
 - Describe basic principles of QoS management
 - Describe QoS management policies
 - Describe QoS management methods
 - List when to use QoS management
 - Outline MIMO feature
 - Describe multiple-antenna reception/ transmission MIMO
 - Describe multiple-antenna transmission MIMO
 - Describe adaptive mode selection and switching of MIMO
 - Set adaptive MIMO
 - Describe PDCCH/PUCCH resource management feature parameters
 - Outline CS Fallback
 - Describe CS Fallback procedure
 - Draw network architecture for CS Fallback to UTRAN/GERAN
 - Describe CS Fallback to UTRAN/GERAN
 - Select CS Fallback mechanisms
 - Perform configuration on eNodeB for CS Fallback
 - Outline CA Basic Concepts and Principles
 - Describe CA Feature Benefit and Influence
 - Perform CA Feature Deployment and Configuration
 - Outline DRX basic concepts
 - Describe DRX realization principles

Training Content

OEO61 LTE eRAN6.0 Basic Features and Algorithms

- LTE eRAN6.0 Idle Mode Behavior
 - Idle Mode Overview
 - PLMN selection
 - Cell selection
 - Cell reselection
 - System information reception
 - Tracking area registration
 - Paging monitoring procedure
- LTE eRAN6.0 Power Control Feature
 - Power control overview
 - Downlink power control
 - Uplink power control
- LTE eRAN6.0 Scheduling Feature
 - Overview of Scheduling

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- Downlink Scheduling
 - Uplink Scheduling
 - Scheduling Deployment Strategy
 - LTE eRAN6.0 DRX and Signaling Control
 - DRX Basic Concepts and Principles
 - DRX Feature Benefit and Influence
 - DRX in RRC_CONNECTED Mode
 - Dynamic DRX
 - High-Mobility-Triggered Idle Mode
 - LTE eRAN6.0 Handover Feature
 - Mobility Management Overview
 - Intra-frequency Handover
 - Inter-frequency Handover
 - Inter-RAT Handover
 - LTE eRAN6.0 Carrier Aggregation Feature
 - CA Basic Concepts and Principles
 - CA Feature Benefit and Influence
 - CA Feature Deployment and Configuration
 - LTE eRAN6.0 MIMO Feature
 - MIMO feature overview
 - Multiple-Antenna reception MIMO
 - Multiple-Antenna transmission MIMO
 - Adaptive mode selection and switching
 - LTE eRAN6.0 QoS Management Feature
 - Overview of QoS Management
 - QoS Management Policies
 - QoS Management Methods
 - When to Use QoS
 - LTE eRAN6.0 CS Fallback
 - CS Fallback Overview
 - LTE Voice Solution
 - CS Fallback Procedure
 - Network Architecture for CS Fallback to UTRAN/GERAN
 - Combined EPS/IMSI Attach Procedure
 - CS Fallback to UTRAN
 - CS Fallback Based on PS Redirection(UMTS)
 - CS Fallback Based on PS Handover(UMTS)
 - CS Fallback to GERAN
 - Decisions and Configuration of eNodeB in CS Fallback
 - Selection of CS Fallback Mechanisms
 - LTE eRAN6.0 Physical Channel Resource Management
 - PDCCH resource management

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- PDCCH symbols adaptively adjusted
 - CCE aggregation adaptively adjusted
 - DL/UL CCE ratio adaptively adjusted
 - PUCCH resource management
 - Adaptive SR period adjustment
 - Adaptive PUCCH resource adjustment

Duration

4 working days

Class Size

Min 6, Max 12

1.4.8 LTE eRAN6.0 SON Features and Algorithms Training

Training Path

LTE eRAN6.0 SON Features and Algorithms		
OEO62	Lecture	1d

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE Air Interface
- LTE Protocols and Procedures
- LTE eRAN6.0 Basic Features and Algorithms

Objectives

On completion of this program, the participants will be able to:

- Outline ANR overview
- Describe intra-RAT ANR management
- Describe inter-RAT ANR management
- Switch on ANR
- Set ANR related parameters
- Outline MRO processing flow
- List classification of intra-RAT MRO
- Describe intra-RAT MRO management
- Describe inter-RAT MRO management
- Set MRO to optimize handover
- Outline PCI conflict detection
- self-optimization overview
- Describe PCI conflict detection
- Describe PCI self-optimization in M2000
- Observe PCI conflict information
- Set PCI conflict detection
- Outline RACH optimization
- Describe prerequisites for RACH optimization
- Describe zero correlation zone configuration

-
- Describe contention-based vs. contention-free random access
 - Describe RACH resource adjustment
 - Perform MML to deploy RACH optimization
 - Describe impact of RACH optimization
 - Outline cell outage detection
 - Describe sleeping cell detection techniques
 - Describe cell outage detection techniques
 - Deploy cell outage detection

Training Content

OEO62 LTE eRAN6.0 SON Features and Algorithms

- LTE eRAN6.0 SON Overview
 - Describe the SON benefits
 - Outline the SON functions
- SON Application in M2000 V200R013
 - Outline SON functions in M2000
 - Enable the SON switches in M2000
 - Check SON logs in M2000
- LTE eRAN6.0 ANR Feature
 - ANR Overview
 - Intra-RAT ANR Management
 - Inter-RAT ANR Management
- LTE eRAN6.0 MRO Feature
 - MRO Processing Flow
 - Classification of Intra-RAT MRO
 - Intra-RAT MRO Management
 - Inter-RAT MRO Management
- LTE eRAN6.0 PCI Conflict Detection#Self-Optimization
 - PCI Conflict Detection
 - Self-Optimization Overview
 - PCI Conflict Detection
 - PCI Self-Optimization in M2000
- LTE eRAN6.0 RACH Optimization
 - Overview of RACH Optimization
 - Prerequisites for RACH Optimization
 - Zero Correlation Zone Configuration
 - Contention-Based vs. Contention-Free Random Access
 - RACH Resource Adjustment
 - Dedicated Preamble Group Adjustment
 - Multiplexing of Dedicated Preambles
 - PRACH Configuration Index Adjustment
 - Adaptive Backoff

-
- MML screenshots
 - Impact of RACH Optimization
 - LTE eRAN6.0 Cell Outage Detection
 - Overview of Cell Outage Detection
 - Sleeping Cell Detection Techniques
 - Cell Outage Detection Techniques
 - Engineering Guidelines

Duration

1 working day

Class Size

Min 6, Max 12

1.4.9 LTE eRAN6.0 TDD Specific Features and Algorithms Training

Training Path

LTE eRAN6.0 TDD Specific Features and Algorithms		
OEO63	Lecture	0.5d

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE Air Interface
- LTE Protocols and Procedures
- LTE eRAN6.0 Basic Features and Algorithms

Objectives

On completion of this program, the participants will be able to:

- Outline beamforming
- Describe beamforming-related concepts
- Describe beamforming principles and techniques
- Describe beamforming feature application scenarios
- Deploy beamforming
- Describe concept of sector, cell and TDD subframe configuration
- Draw TDD frame structure
- Describe uplink-downlink subframe configurations
- Describe configurations of special subframes
- Describe when to use subframe configuration
- Perform subframe configuration

Training Content

OEO63 LTE eRAN6.0 TDD Specific Features and Algorithms

- LTE eRAN6.0 Beamforming Feature
 - Overview of Beamforming
 - Beamforming-Related Concepts
 - Beamforming Principles and Techniques
 - Beamforming Feature Application Scenarios
 - Beamforming Deployment

-
- LTE eRAN6.0 Subframe Configuration Feature
 - Concept of Sector, cell and TDD Subframe Configuration
 - TDD Frame Structure
 - Uplink-Downlink Subframe Configurations
 - Configurations of Special Subframes
 - When to Use Subframe Configuration
 - Subframe Configuration Deployment

Duration

0.5 working day

Class Size

Min 6, Max 12

1.4.10 LTE eRAN6.0 Performance Improving Features and Algorithms Training

Training Path

LTE eRAN6.0 Performance Improving Features and Algorithms		
OEO64	Lecture	2d

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE Air Interface
- LTE Protocols and Procedures
- LTE eRAN6.0 Basic Features and Algorithms

Objectives

On completion of this program, the participants will be able to:

- Describe admission control
- Set admission control
- Describe congestion control
- Outline load monitoring
- Outline load balance
- Describe intra - frequency load balance
- Describe inter-frequency load balance
- Describe inter-RAT load balance
- Outline compact bandwidth
- Describe key technologies of compact bandwidth
- Describe related physical resource management
- Deploy compact bandwidth
- Outline UL CoMP
- Describe application scenarios of UL CoMP
- Describe key techniques for UL CoMP
- Describe related features of UL CoMP
- Deploy UL CoMP
- Outline ICIC
- Describe downlink ICIC

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- Describe uplink ICIC
 - Describe ICIC deployment strategy
 - Deploy ICIC
 - Outline principle and algorithm of RAN Sharing(Optional)

Training Content

OEO64 LTE eRAN6.0 Performance Improving Features and Algorithms

- LTE eRAN6.0 Admission and Congestion Control
 - Load Monitoring
 - Admission Control
 - Non-GBR Service Admission Control
 - GBR Service Admission Flow
 - QoS Satisfaction Rate Based Admission Control
 - Congestion Control
- LTE eRAN6.0 ICIC Feature
 - Overview of ICIC
 - Downlink ICIC
 - Uplink ICIC
 - ICIC Deployment Strategy
- LTE eRAN6.0 UL Comp
 - Benefit of UL CoMP
 - Principle for UL CoMP
 - Application scenario of UL CoMP
 - Engineering Guidelines of UL CoMP
- LTE eRAN6.0 Compact Bandwidth Feature
 - Overview of Compact Bandwidth
 - Key Technologies of Compact Bandwidth
 - Related Physical Resource Management
- LTE eRAN6.0 MLB Feature
 - Load Balance Overview
 - Intra - frequency Load Balance
 - Inter-frequency Load Balance
 - Inter - RAT Load Balance
- LTE eRAN6.0 RAN Sharing
 - Overview of RAN Sharing
 - RAN Sharing with Common Carriers
 - RAN Sharing with Dedicated Carriers
 - Engineering Guidelines of RAN Sharing

Duration

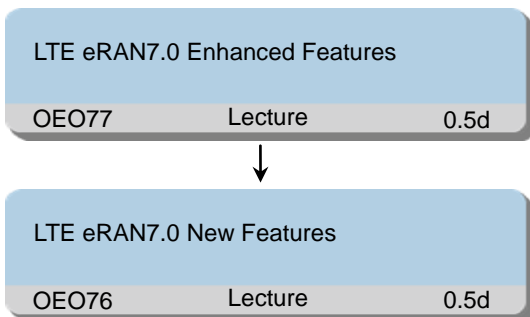
2 working days

Class Size

Min 6, Max 12

1.4.11 LTE eRAN7.0 Feature Delta Training

Training Path



Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE Air Interface
- LTE Protocols and Procedures
- LTE eRAN6.0 Features and Algorithms

Objectives

On completion of this program, the participants will be able to:

- Describe enhanced functions in Handover Feature from eRAN6.0 to eRAN7.0
- Describe enhanced and new functions in CS Fallback from eRAN6.0 to eRAN7.0
- Describe enhanced functions in Cell Outage Detection from eRAN6.0 to eRAN7.0
- Describe new functions in DRX and Signaling Control from eRAN6.0 to eRAN7.0
- Describe new features in eRAN7.0

Training Content

OEO77 LTE eRAN7.0 Enhanced Features

- LTE eRAN7.0 Enhanced Features
 - RIM Based LTE Target Cell Selection
 - Coverage Based Inter-frequency/ Inter-RAT Handover
 - LTE enhanced scheduling: MBR>GBR
 - User number based MLB

OEO76 LTE eRAN7.0 New Features

- LTE eRAN7.0 New Features
 - SFN (Single frequency network)

-
- Uplink timing
 - Coordinated Scheduling based power control
 - Intelligent Access Class Control

Duration

1 working day

Class Size

Min 6, Max 12

1.4.12 LTE eRAN7.0 Basic Features and Algorithms Training

Training Path

LTE eRAN7.0 Basic Features and Algorithms		
OEO71	Lecture	4d

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE Air Interface
- LTE Protocols and Procedures

Objectives

On completion of this program, the participants will be able to:

- Outline idle mode
- Describe PLMN selection
- Describe cell selection and cell reselection
- Config cell selection
- Config cell reselection measurement
- Describe system information reception
- Config SIB
- Describe tracking area registration
- Describe paging monitoring procedure
- Outline mobility management
- Describe intra-frequency handover
- Describe inter-frequency handover
- Describe inter-rat handover
- Set measurement configuration
- Set handover related parameters
- Outline power control
- Describe downlink power control
- Describe uplink power control
- Set initial power
- Outline scheduling

-
- Describe downlink scheduling
 - Describe uplink scheduling
 - Describe scheduling deployment strategy
 - Describe basic principles of QoS management
 - Describe QoS management policies
 - Describe QoS management methods
 - List when to use QoS management
 - Outline MIMO feature
 - Describe multiple-antenna reception/ transmission MIMO
 - Describe multiple-antenna transmission MIMO
 - Describe adaptive mode selection and switching of MIMO
 - Set adaptive MIMO
 - Describe PDCCH/PUCCH resource management feature parameters
 - Outline CS Fallback
 - Describe CS Fallback procedure
 - Draw network architecture for CS Fallback to UTRAN/GERAN
 - Describe CS Fallback to UTRAN/GERAN
 - Select CS Fallback mechanisms
 - Perform configuration on eNodeB for CS Fallback
 - Outline CA Basic Concepts and Principles
 - Describe CA Feature Benefit and Influence
 - Perform CA Feature Deployment and Configuration
 - Outline DRX basic concepts
 - Describe DRX realization principles

Training Content

OEO71 LTE eRAN7.0 Basic Features and Algorithms

- LTE eRAN7.0 Idle Mode Behavior
 - Idle Mode Overview
 - PLMN selection
 - Cell selection
 - Cell reselection
 - System information reception
 - Tracking area registration
 - Paging monitoring procedure
- LTE eRAN7.0 Power Control Feature
 - Power control overview
 - Downlink power control
 - Uplink power control
- LTE eRAN7.0 Scheduling Feature
 - Overview of Scheduling

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- Downlink Scheduling
 - Uplink Scheduling
 - Scheduling Deployment Strategy
 - LTE eRAN7.0 DRX and Signaling Control
 - DRX Basic Concepts and Principles
 - DRX Feature Benefit and Influence
 - DRX in RRC_CONNECTED Mode
 - Dynamic DRX
 - High-Mobility-Triggered Idle Mode
 - LTE eRAN7.0 Handover Feature
 - Mobility Management Overview
 - Intra-frequency Handover
 - Inter-frequency Handover
 - Inter-RAT Handover
 - LTE eRAN7.0 Carrier Aggregation Feature
 - CA Basic Concepts and Principles
 - CA Feature Benefit and Influence
 - CA Feature Deployment and Configuration
 - LTE eRAN7.0 MIMO Feature
 - MIMO feature overview
 - Multiple-Antenna reception MIMO
 - Multiple-Antenna transmission MIMO
 - Adaptive mode selection and switching
 - LTE eRAN7.0 QoS Management Feature
 - Overview of QoS Management
 - QoS Management Policies
 - QoS Management Methods
 - When to Use QoS
 - LTE eRAN7.0 CS Fallback
 - CS Fallback Overview
 - LTE Voice Solution
 - CS Fallback Procedure
 - Network Architecture for CS Fallback to UTRAN/GERAN
 - Combined EPS/IMSI Attach Procedure
 - CS Fallback to UTRAN
 - CS Fallback Based on PS Redirection(UMTS)
 - CS Fallback Based on PS Handover(UMTS)
 - CS Fallback to GERAN
 - Decisions and Configuration of eNodeB in CS Fallback
 - Selection of CS Fallback Mechanisms
 - LTE eRAN7.0 Physical Channel Resource Management
 - PDCCH resource management

-
- PDCCH symbols adaptively adjusted
 - CCE aggregation adaptively adjusted
 - DL/UL CCE ratio adaptively adjusted
 - PUCCH resource management
 - Adaptive SR period adjustment
 - Adaptive PUCCH resource adjustment

Duration

4 working days

Class Size

Min 6, Max 12

1.4.13 LTE eRAN7.0 SON Features and Algorithms Training

Training Path

LTE eRAN7.0 SON Features and Algorithms		
OEO72	Lecture	1d

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE Air Interface
- LTE Protocols and Procedures
- LTE eRAN7.0 Basic Features and Algorithms

Objectives

On completion of this program, the participants will be able to:

- Outline ANR overview
- Describe intra-RAT ANR management
- Describe inter-RAT ANR management
- Switch on ANR
- Set ANR related parameters
- Outline MRO processing flow
- List classification of intra-RAT MRO
- Describe intra-RAT MRO management
- Describe inter-RAT MRO management
- Set MRO to optimize handover
- Outline PCI conflict detection
- self-optimization overview
- Describe PCI conflict detection
- Describe PCI self-optimization in U2000
- Observe PCI conflict information
- Set PCI conflict detection
- Outline RACH optimization
- Describe prerequisites for RACH optimization
- Describe zero correlation zone configuration

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- Describe contention-based vs. contention-free random access
 - Describe RACH resource adjustment
 - Perform MML to deploy RACH optimization
 - Describe impact of RACH optimization
 - Outline cell outage detection
 - Describe sleeping cell detection techniques
 - Describe cell outage detection techniques
 - Deploy cell outage detection

Training Content

OEO72 LTE eRAN7.0 SON Features and Algorithms

- LTE eRAN7.0 SON Overview
 - Describe the SON benefits
 - Outline the SON functions
- SON Application in U2000 V200R013
 - Outline SON functions in U2000
 - Enable the SON switches in U2000
 - Check SON logs in U2000
- LTE eRAN7.0 ANR Feature
 - ANR Overview
 - Intra-RAT ANR Management
 - Inter-RAT ANR Management
- LTE eRAN7.0 MRO Feature
 - MRO Processing Flow
 - Classification of Intra-RAT MRO
 - Intra-RAT MRO Management
 - Inter-RAT MRO Management
- LTE eRAN7.0 PCI Conflict Detection#Self-Optimization
 - PCI Conflict Detection
 - Self-Optimization Overview
 - PCI Conflict Detection
 - PCI Self-Optimization in U2000
- LTE eRAN7.0 RACH Optimization
 - Overview of RACH Optimization
 - Prerequisites for RACH Optimization
 - Zero Correlation Zone Configuration
 - Contention-Based vs. Contention-Free Random Access
 - RACH Resource Adjustment
 - Dedicated Preamble Group Adjustment
 - Multiplexing of Dedicated Preambles
 - PRACH Configuration Index Adjustment
 - Adaptive Backoff

-
- MML screenshots
 - Impact of RACH Optimization
 - LTE eRAN7.0 Cell Outage Detection
 - Overview of Cell Outage Detection
 - Sleeping Cell Detection Techniques
 - Cell Outage Detection Techniques
 - Engineering Guidelines

Duration

1 working day

Class Size

Min 6, Max 12

1.4.14 LTE eRAN7.0 TDD Specific Features and Algorithms Training

Training Path

LTE eRAN7.0 TDD Specific Features and Algorithms		
OEO73	Lecture	0.5d

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE Air Interface
- LTE Protocols and Procedures
- LTE eRAN7.0 Basic Features and Algorithms

Objectives

On completion of this program, the participants will be able to:

- Outline beamforming
- Describe beamforming-related concepts
- Describe beamforming principles and techniques
- Describe beamforming feature application scenarios
- Deploy beamforming
- Describe concept of sector, cell and TDD subframe configuration
- Draw TDD frame structure
- Describe uplink-downlink subframe configurations
- Describe configurations of special subframes
- Describe when to use subframe configuration
- Perform subframe configuration

Training Content

OEO73 LTE eRAN7.0 TDD Specific Features and Algorithms

- LTE eRAN7.0 Beamforming Feature
 - Overview of Beamforming
 - Beamforming-Related Concepts
 - Beamforming Principles and Techniques
 - Beamforming Feature Application Scenarios
 - Beamforming Deployment

-
- LTE eRAN7.0 Subframe Configuration Feature
 - Concept of Sector, cell and TDD Subframe Configuration
 - TDD Frame Structure
 - Uplink-Downlink Subframe Configurations
 - Configurations of Special Subframes
 - When to Use Subframe Configuration
 - Subframe Configuration Deployment

Duration

0.5 working day

Class Size

Min 6, Max 12

1.4.15 LTE eRAN7.0 Performance Improving Features and Algorithms Training

Training Path

LTE eRAN7.0 Performance Improving Features and Algorithms		
OEO74	Lecture	2d

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE Air Interface
- LTE Protocols and Procedures
- LTE eRAN7.0 Basic Features and Algorithms

Objectives

On completion of this program, the participants will be able to:

- Describe admission control
- Set admission control
- Describe congestion control
- Outline load monitoring
- Outline load balance
- Describe intra - frequency load balance
- Describe inter-frequency load balance
- Describe inter-RAT load balance
- Outline compact bandwidth
- Describe key technologies of compact bandwidth
- Describe related physical resource management
- Deploy compact bandwidth
- Outline UL CoMP
- Describe application scenarios of UL CoMP
- Describe key techniques for UL CoMP
- Describe related features of UL CoMP
- Deploy UL CoMP
- Outline ICIC
- Describe downlink ICIC

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- Describe uplink ICIC
 - Describe ICIC deployment strategy
 - Deploy ICIC
 - Outline principle and algorithm of RAN Sharing(Optional)

Training Content

OEO74 LTE eRAN7.0 Performance Improving Features and Algorithms

- LTE eRAN7.0 Admission and Congestion Control
 - Load Monitoring
 - Admission Control
 - Non-GBR Service Admission Control
 - GBR Service Admission Flow
 - QoS Satisfaction Rate Based Admission Control
 - Congestion Control
- LTE eRAN7.0 ICIC Feature
 - Overview of ICIC
 - Downlink ICIC
 - Uplink ICIC
 - ICIC Deployment Strategy
- LTE eRAN7.0 UL Comp
 - Benefit of UL CoMP
 - Principle for UL CoMP
 - Application scenario of UL CoMP
 - Engineering Guidelines of UL CoMP
- LTE eRAN7.0 Compact Bandwidth Feature
 - Overview of Compact Bandwidth
 - Key Technologies of Compact Bandwidth
 - Related Physical Resource Management
- LTE eRAN7.0 MLB Feature
 - Load Balance Overview
 - Intra - frequency Load Balance
 - Inter-frequency Load Balance
 - Inter - RAT Load Balance
- LTE eRAN7.0 RAN Sharing
 - Overview of RAN Sharing
 - RAN Sharing with Common Carriers
 - RAN Sharing with Dedicated Carriers
 - Engineering Guidelines of RAN Sharing

Duration

2 working days

Class Size

Min 6, Max 12

1.4.16 LTE Tuning Training

Training Path

LTE Network Tuning		
OEO01	Lecture, Demo	1d

Target Audience

System Technician
Service Technician
System Engineer
Service Engineer

Prerequisites

- Successful completion of the following courses:
- LTE Air Interface
- LTE Protocols and Procedures

Objectives

On completion of this program, the participants will be able to:

- Describe basic process of RF optimization
- Make test preparations
- Collect data collection for tuning
- List factors affecting coverage
- List solutions for weak coverage
- List solutions for cross coverage
- List solutions for lack of dominant cell
- Perform basic coverage problem analysis
- List main handover problems during network tuning
- Perform basic handover problem analysis
- Perform basic RF adjustment
- Familiar Huawei GENEX Probe & Assistant Operation

Training Content

OEO01 LTE Network Tuning

- LTE Network Tuning
 - Overview of RF Optimization
 - Basic Process of RF Optimization
 - Test Preparations
 - Data Collection
 - Coverage Problem Analysis
 - Handover Problem Analysis

-
- RF Adjustment
 - GENEX Probe V300R006 Operation for LTE
 - Huawei GENEX Series Tools
 - GENEX Probe Introduction
 - GENEX Probe Operation Process
 - GENEX Probe Test Parameters
 - GENEX Probe Additional Function and Operation
 - GENEX Probe Cases Analysis
 - GENEX Assistant V300R006 Operation for LTE
 - GENEX Assistant Introduction
 - GENEX Assistant Operation Process
 - GENEX Assistant Additional Function and Operation
 - GENEX Assistant Cases Analysis

Duration

1 working day

Class Size

Min 6, Max 12

1.4.17 LTE Performance Management Training

Training Path

LTE Performance Management		
OEO03	Lecture, Lab	1d

Target Audience

System Technician
Service Technician
System Engineer
Service Engineer

Prerequisites

- Successful completion of the following courses:
- LTE Air Interface
- LTE Protocols and Procedures
- LTE Basic Features and Algorithms

Objectives

On completion of this program, the participants will be able to:

- Describe the structure of LTE performance measurement system
- List classification of KPI
- Describe accessibility KPI and detail the counters of it
- Describe retainability KPIs and detail the counters of them
- Describe mobility KPIs and detail the counters of them
- Describe service integrity
- Describe utilization KPIs and detail the counters of them
- Describe availability KPIs and detail the counters of them
- Describe traffic KPI and detail the counters of them
- Describe performance management basic concepts
- Describe measurement management
- Implement performance measurement operations on M2000
- Implement custom counter management
- Query performance result

Training Content

OEO03 LTE Performance Management

- LTE KPI Introduction
 - LTE KPI Overview
 - Classification of KPI
 - Performance Measurement System

-
- LTE KPI Details
 - Accessibility KPI
 - Retainability KPIs
 - Mobility KPIs
 - Equipment Related
 - Utilization KPIs / Traffic KPI
 - Transport Performance Counter
 - LTE KPI Report Delivery
 - iManager M2000 V200R013 Performance Management
 - The structure of LTE performance measurement system
 - The main KPI in LTE, and detail the counters for the key KPI, such as accessibility, retain ability, mobility, availability, utilization, traffic, latency, Integrity
 - Implement performance measurement operations on M2000

Duration

1 working day

Class Size

Min 6, Max 12

1.4.18 LTE Radio Network Optimize Training

Training Path

LTE Radio Network Optimize		
OEO06	Lecture	2d

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE Air Interface
- LTE Protocols and Procedures
- LTE Features and Algorithms

Objectives

On completion of this program, the participants will be able to:

- Outline handover procedure
- Perform handover fault analysis
- Describe typical case of handover fault
- Describe basic principle of access
- Describe fault diagnosis process
- Perform operations of fault diagnosis
- Perform checking hardware connections
- Perform checking version mapping
- Perform checking the eNodeB configuration
- Perform checking quality on the air interface
- Perform checking the EPC configuration
- Describe time and frequency resources and throughput calculation
- Describe throughput fault diagnosis procedures and methods
- Describe processes of data transmission fault diagnosis
- Describe basic requirements for fault diagnosis
- Perform diagnosis for locating downlink data transmission faults
- Perform diagnosis for uplink problems

Training Content

OEO06 LTE Radio Network Optimize

-
- LTE Handover Fault Diagnosis
 - Handover Procedure Review
 - Handover Fault Analysis
 - Typical Case of Handover Fault
 - LTE Call Drop Fault Diagnosis
 - Call Drop Fault Diagnosis Process
 - Operations of Call Drop Fault Diagnosis
 - Checking Hardware Connections
 - Checking Version Mapping
 - Checking the eNodeB Configuration
 - Checking Quality on the Air Interface
 - Checking the EPC Configuration
 - LTE Access Fault Diagnosis
 - Basic Principle of Access
 - Access Fault Diagnosis Process
 - Operations of Access Fault Diagnosis
 - Checking Hardware Connections
 - Checking Version Mapping
 - Checking the eNodeB Configuration
 - Checking Quality on the Air Interface
 - Checking the EPC Configuration
 - LTE Traffic Fault Diagnosis
 - Methodology of Traffic Fault Diagnosis
 - Air Interface Fault diagnosis
 - UDP Fault Diagnosis
 - TCP Fault Diagnosis

Duration

2 working days

Class Size

Min 6, Max 12

1.4.19 LTE Interoperability Training

Training Path

LTE Interoperability		
OE025	Lecture	1d

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE Air Interface
- LTE Protocols and Procedures

Objectives

On completion of this program, the participants will be able to:

- Outline challenges for LTE interoperability
- Describe GUL interoperability network architecture and interfaces
- Describe IRAT PLMN selection process, cell selection/selection process and signaling procedure in idle mode
- Describe IRAT measurement triggering/stopping phase, measurement phase, execution phase and signaling procedure in connection mode
- Application and realization of IRAT

Training Content

OE025 LTE Interoperability

- eRAN6.0 LTE->GU Interoperability in Idle Mode
 - LTE Interoperability in Idle Mode Overview
 - IRAT PLMN Selection Procedure
 - IRAT Cell Selection Criteria
 - IRAT Cell Reselection Criteria
 - IRAT Signaling Procedure in Idle Mode
- eRAN6.0 LTE->GU Interoperability in Connection Mode
 - Technical Overview and Basic Concepts
 - Measurement Configuration
 - Measurement Triggering/Stopping Phase of an IRAT Handover
 - Redirection

-
- Blind Handover
 - Measurement Phase of an IRAT Handover
 - Decision Phase of an IRAT Handover
 - Execution Phase of an IRAT Handover
 - IRAT Signaling Procedure in Connection Mode

Duration

0.5 working day

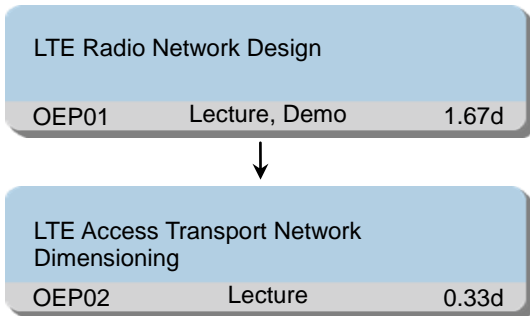
Class Size

Min 6, Max 12

1.5 RNP

1.5.1 LTE Network Design and Dimensioning Training

Training Path



Target Audience

Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE Air Interface
- LTE Protocols and Procedures

Objectives

On completion of this program, the participants will be able to:

- Outline LTE radio network planning
- Describe LTE radio network planning Process
- Describe differences between 2G/3G and LTE Dimensioning
- Perform LTE radio network coverage dimensioning
- Perform LTE link budget
- Describe propagation model
- Perform site number dimensioning
- Outline capacity dimensioning procedure
- Describe traffic model and parameters
- Perform radio network throughput calculation
- Analysis DL Throughput
- Analysis UL Throughput
- Perform throughput per cell(IP) dimensioning
- Perform capacity dimensioning
- Outline frequency planning
- Outline TA planning

-
- Outline PCI planning
 - Outline PRACH planning
 - Describe the LTE transport networking
 - Describe the S1 and X2 interface protocol
 - Explain IP functionality, such as VLAN, IP sec etc.
 - Perform transport network dimensioning
 - Perform eNodeB hardware dimensioning

Training Content

OEP01 LTE Radio Network Design

- LTE Radio Network Coverage Dimensioning
 - LTE Radio Network Planning Introduction
 - LTE Radio Network Planning Process
 - Differences between 2G/3G and LTE Dimensioning
 - LTE Radio Network Coverage Dimensioning
 - LTE Link Budget
 - Propagation Model
 - Site Number Dimensioning
- LTE Radio Network Capacity Dimensioning
 - Capacity Dimensioning Procedure
 - Network Throughput
 - Introduction of Traffic Model
 - Traffic Model and Parameters
 - Network Throughput Calculation
 - Cell Throughput
 - DL Throughput Analysis
 - UL Throughput Analysis
 - Throughput per Cell(IP)
 - Capacity Dimensioning
- LTE Cell Planning
 - LTE Planning Overview
 - Frequency Planning
 - TA Planning
 - PCI Planning
 - PRACH Planning

OEP02 LTE Access Transport Network Dimensioning

- LTE Access Transport Network Dimensioning
 - Transport Architecture and Networking
 - IP Transport Functionality
 - IP Transport Dimensioning

Duration

2 working days

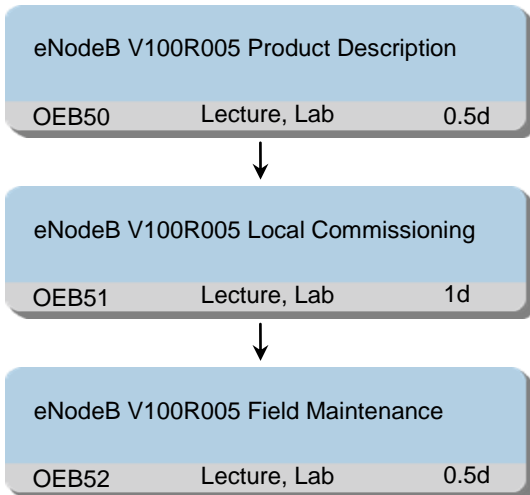
Class Size

Min 6, Max 12

1.6 Product

1.6.1 LTE eRAN3.0 Field Maintenance Training

Training Path



Target Audience

Field Technician
System Technician
Network Deployment Engineer

Prerequisites

- Successful completion of the following courses:
- LTE System Overview

Objectives

On completion of this program, the participants will be able to:

- Describe the hardware structure of eNodeB
- Describe the logical structure of eNodeB
- Describe the working principle and functions of eNodeB boards
- Describe the procedure of eNodeB commissioning
- Describe the related concept of eNodeB software and configuration file
- Querying the current version of eNodeB
- Use USB disk to commission the eNodeB
- Commission the eNodeB through LMT
- Verify commissioning result
- Power up/down the eNodeB and connect up LMT to the node
- Find the alarm list of eNodeB
- Perform corrective and preventive maintenance on eNodeB
- Find faulty hardware units and replace them

Training Content

OEB50 eNodeB V100R005 Product Description

- eNodeB LTE FDD V100R005 Product Description
 - eNodeB System Overview
 - eNodeB System Structure
 - eNodeB Auxiliary Devices
 - eNodeB Typical Networking

OEB51 eNodeB V100R006 Local Commissioning

- eNodeB LTE V100R005 Local Commissioning
 - eNodeB Commissioning Overview
 - eNodeB Local Commissioning through the USB Disk
 - Procedure for the Local Commissioning through the USB Disk
 - Download and active the Software and Data Configuration File
 - eNodeB Local Commissioning on the LMT
 - Prepare for the Local eNodeB Commissioning on the LMT
 - Upgrade the eNodeB Software and Data Configuration File on the LMT
 - Download the License on the LMT
 - Query the Running Status
 - Establish an OM Link Between the M2000 and the eNodeB

OEB52 eNodeB V100R005 Field Maintenance

- eNodeB LTE V100R005 Field Maintenance
 - Powering up/down the eNodeB and connect up LMT to the node
 - Finding the alarm list of eNodeB
 - Perform corrective and preventive maintenance on eNodeB
 - Finding Faulty Hardware units and replace them

Duration

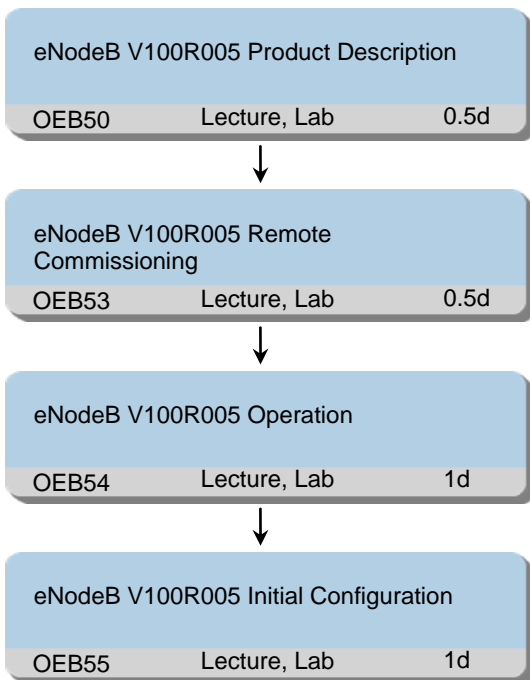
2 working days

Class Size

Min 6, Max 12

1.6.2 LTE eRAN3.0 Operation and Configuration Training

Training Path



Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE System Overview

Objectives

On completion of this program, the participants will be able to:

- Describe the hardware structure of eNodeB
- Describe the logical structure of eNodeB
- Describe the working principle and functions of eNodeB boards
- Explain the architecture and components of eNodeB operation and maintenance system
- Install LMT software
- Install M2000 client software
- Use LMT login eNodeB
- Use M2000 client Login M2000 server and eNodeB
- Execute MML in single mode
- Execute MML in batch mode

-
- Manage alarms of eNodeB
 - Manage device, such as querying board states, blocking board and unblocking board
 - Manage software, such as querying current software version and backup configuration file
 - Manage transport data, such as querying IP address of Ethernet port and querying IP route
 - Manage radio data, such as querying cell states and querying neighbor cell
 - Manage tracing message, for example: creating a tracing task, checking tracing result, saving result
 - Manage real-time monitoring, for example: creating a monitoring task, checking and saving monitoring result
 - Describe the procedure of eNodeB commissioning
 - Describe the related concept of eNodeB software and configuration file
 - Querying the current version of eNodeB
 - Commission the eNodeB through M2000
 - Verify commissioning result
 - Outline the procedure of eNodeB data configuration
 - Describe the main table of "eNodeB Summary Data"
 - Use LTE Configuration System to create project
 - Use LTE Configuration System to import external template
 - Use LTE Configuration System to query data configuration and modify data
 - Use LTE Configuration System to check up data
 - Use LTE Configuration System to export data

Training Content

OEB50 eNodeB V100R005 Product Description

- eNodeB LTE FDD V100R005 Product Description
 - eNodeB System Overview
 - eNodeB System Structure
 - eNodeB Auxiliary Devices
 - eNodeB Typical Networking

OEB53 eNodeB V100R005 Remote Commissioning

- eNodeB LTE V100R005 Remote Commissioning
 - eNodeB Commissioning Overview
 - eNodeB Remote Commissioning on the M2000

OEB54 eNodeB V100R005 Operation

- eNodeB LTE V100R005 Operation
 - Structure of operation and maintenance system
 - Login eNodeB OM system
 - eNodeB equipment management
 - eNodeB transport management
 - eNodeB radio management
 - Backup eNodeB configuration file, query eNodeB version
 - Tracing and real time monitoring

-
- eNodeB LTE V100R005 Operation Praticice Guide
 - Practise on eNodeB operation

OEB55 eNodeB V100R005 Initial Configuration

- eNodeB LTE V100R005 Initial Configuration
 - eNodeB Data Configuration Introduction
 - Preparing eNodeB Data
 - Creating eNodeB Data
 - Adjusting eNodeB Data
 - Checking eNodeB Data
 - Exporting eNodeB Data
- eNodeB LTE V100R005 SUMMARY Description
 - SUMMARY introduction
 - Creating bulk eNodeBs with Summary
 - Checking data

Duration

3 working days

Class Size

Min 6, Max 12

1.6.3 LTE eRAN3.0 Reconfiguration Training

Training Path

eNodeB V100R005 Reconfiguration		
OEB57	Lecture, Lab	1d

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE System Overview
- eNodeB LTE V100R005 Product Description

Objectives

On completion of this program, the participants will be able to:

- Outline CME/MML operation
- Perform capacity expansion
- Perform adding an FDD cell
- Perform changing the cell bandwidth
- Perform adding an MME Connection
- Perform adding an S-GW Connection
- Perform network reconstruction
- Perform changing the cell EARFCNs
- Perform changing the Cell PCI
- Perform changing the Cell ID
- Perform relocating an MME
- Perform relocating an S-GW

Training Content

OEB57 eNodeB V100R005 Reconfiguration

- eNodeB LTE V100R005 Reconfiguration
 - CME/MML Command Operation Instructions
 - Capacity Expansion
 - Adding an FDD Cell
 - Changing the Cell Bandwidth
 - Adding an MME Connection
 - Adding an S-GW Connection

-
- Network Reconstruction
 - Changing the Cell EARFCNs
 - Changing the Cell PCI
 - Changing the Cell ID
 - Relocating an MME
 - Relocating an S-GW
 - eNodeB LTE V100R005 Reconfiguration Practice Guide
 - Practise on eNodeB V100R005 reconfiguration

Duration

1 working days

Class Size

Min 6, Max 12

1.6.4 LTE eRAN3.0 Troubleshooting Training

Training Path

eNodeB V100R005 Troubleshooting		
OEB56	Lecture, Lab	1d

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE System Overview
- eNodeB LTE V100R005 Product Description
- eNodeB LTE V100R005 Reconfiguration

Objectives

On completion of this program, the participants will be able to:

- Outline the procedure of eNodeB troubleshooting flow
- Perform the alarm management and analysis
- Perform the log collection
- Draw hardware fault handling procedure
- Handle with the main faults of device level
- Draw transport fault handling procedure
- Handle with the main faults of transport level
- Draw radio fault diagnosis process
- Check the eNodeB radio configuration
- Check quality on the air interface
- Check the EPC configuration
- Handle with the main faults of radio level

Training Content

OEB56 eNodeB V100R005 Troubleshooting

- eNodeB LTE V100R005 Troubleshooting
 - The procedure of eNodeB troubleshooting flow
 - The alarm management and analysis
 - The log collection
 - The main faults processing of device level
 - The main faults processing of transport level

-
- The main faults processing of radio level

Duration

1 working day

Class Size

Min 6, Max 12

1.6.5 LTE eRAN3.0 Product Delta Training

Training Path

LTE eRAN3.0 O&M Enhancement		
OEB58	Lecture	0.5d

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE Air Interface
- LTE Protocols and Procedures
- eNodeB V100R003 Data Configuration
- LTE eRAN2.1 Features and Algorithms

Objectives

On completion of this program, the participants will be able to:

- Outline the new hardware
- Describe O
- M new and enhanced functions

Training Content

OEB58 LTE eRAN3.0 O&M Enhancement

- LTE eRAN3.0 O&M Enhancement
 - LTE eRAN3.0 Hardware Delta
 - New BBU Board
 - New RRU Board
 - LTE eRAN3.0 OM Enhancement
 - Describe LMT delta functions
 - Describe M2000 client delta functions

Duration

0.5 working day

Class Size

Min 6, Max 12

1.6.6 LTE eRAN3.0 Transmission Features and Algorithms Training

Training Path

LTE eRAN3.0 Transmission Features and Algorithms		
OET58	Lecture	1d

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:
- eNodeB V100R005 Initial Configuration

Objectives

On completion of this program, the participants will be able to:

- Introduction TRM Algorithms
- Explain transport Resource Configurations and Mapping
- Describe Transport Load Control
- Describe Transmission Security principle
- Explain Transmission Security Mechanisms
- Outline LTE synchronization
- Describe frequency and time synchronization
- List synchronization sources
- Describe working modes of clocks
- Perform synchronization configuration

Training Content

OET58 LTE eRAN3.0 Transmission Features and Algorithms

- LTE eRAN3.0 Transmission Security Feature
 - Overview of Transmission Security
 - End-to-End Certificate Management
 - Transmission Security Mechanisms
 - When to Use Transmission Security
 - Transmission Security Deployment
- LTE eRAN3.0 Transport Resource Management Feature
 - Overview of TRM Algorithms
 - Transport Resource Configurations and Mapping

-
- Transport Load Control
 - Engineering Guidelines of TRM
 - LTE eRAN3.0 Synchronization
 - Overview of LTE Synchronization
 - Frequency and Time Synchronization
 - Synchronization Sources
 - Selection of Synchronization Sources
 - Working Modes of Clocks
 - Synchronization Configuration
 - Synchronization Activation Observation
 - Synchronization Fault Troubleshooting

Duration

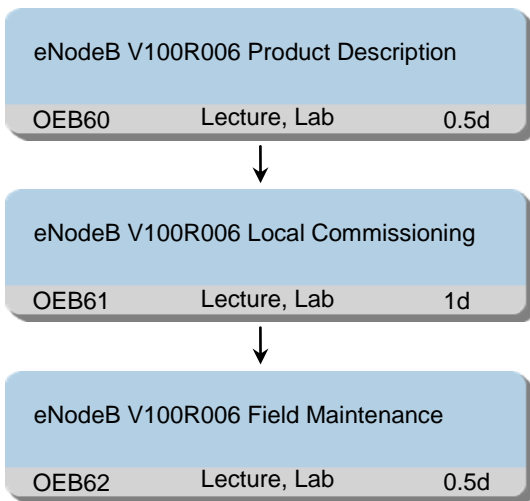
1 working day

Class Size

Min 6, Max 12

1.6.7 LTE eRAN6.0 Field Maintenance Training

Training Path



Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE System Overview

Objectives

On completion of this program, the participants will be able to:

- Describe the hardware structure of eNodeB
- Describe the logical structure of eNodeB
- Describe the working principle and functions of eNodeB boards
- Describe the procedure of eNodeB commissioning
- Describe the related concept of eNodeB software and configuration file
- Querying the current version of eNodeB
- Use USB disk to commission the eNodeB
- Commission the eNodeB through LMT
- Verify commissioning result
- Power up/down the eNodeB and connect up LMT to the node
- Find the alarm list of eNodeB
- Perform corrective and preventive maintenance on eNodeB
- Find faulty hardware units and replace them

Training Content

OEB60 eNodeB V100R006 Product Description

- eNodeB LTE FDD V100R006 Product Description
 - eNodeB System Overview
 - eNodeB System Structure
 - eNodeB Auxiliary Devices
 - eNodeB Typical Networking

OEB61 eNodeB V100R006 Local Commissioning

- eNodeB LTE V100R006 Local Commissioning
 - eNodeB Commissioning Overview
 - eNodeB Local Commissioning through the USB Disk
 - Procedure for the Local Commissioning through the USB Disk
 - Download and active the Software and Data Configuration File
 - eNodeB Local Commissioning on the LMT
 - Prepare for the Local eNodeB Commissioning on the LMT
 - Upgrade the eNodeB Software and Data Configuration File on the LMT
 - Download the License on the LMT
 - Query the Running Status
 - Establish an OM Link Between the M2000 and the eNodeB

OEB62 eNodeB V100R006 Field Maintenance

- eNodeB LTE V100R006 Field Maintenance
 - Powering up/down the eNodeB and connect up LMT to the node
 - Finding the alarm list of eNodeB
 - Perform corrective and preventive maintenance on eNodeB
 - Finding Faulty Hardware units and replace them

Duration

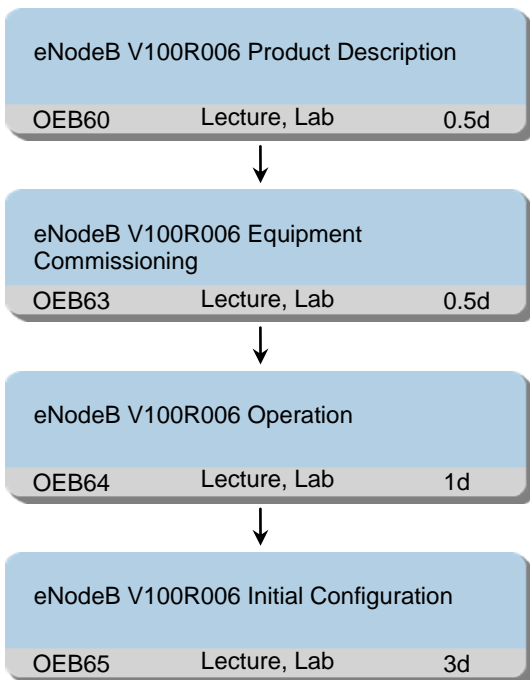
2 working days

Class Size

Min 6, Max 12

1.6.8 LTE eRAN6.0 Operation and Configuration Training

Training Path



Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE System Overview

Objectives

On completion of this program, the participants will be able to:

- Describe the hardware structure of eNodeB
- Describe the logical structure of eNodeB
- Describe the working principle and functions of eNodeB boards
- Explain the architecture and components of eNodeB operation and maintenance system
- Install LMT software
- Install M2000 client software
- Use LMT login eNodeB
- Use M2000 client Login M2000 server and eNodeB
- Execute MML in single mode
- Execute MML in batch mode

-
- Manage alarms of eNodeB
 - Manage device, such as querying board states, blocking board and unblocking board
 - Manage software, such as querying current software version and backup configuration file
 - Manage transport data, such as querying IP address of Ethernet port and querying IP route
 - Manage radio data, such as querying cell states and querying neighbor cell
 - Manage tracing message, for example: creating a tracing task, checking tracing result, saving result
 - Manage real-time monitoring, for example: creating a monitoring task, checking and saving monitoring result
 - Describe the procedure of eNodeB commissioning
 - Describe the related concept of eNodeB software and configuration file
 - Querying the current version of eNodeB
 - Commission the eNodeB through M2000
 - Verify commissioning result
 - Outline the procedure of eNodeB data configuration
 - Describe the main table of "eNodeB Summary Data"
 - Use LTE Configuration System to create project
 - Use LTE Configuration System to import external template
 - Use LTE Configuration System to query data configuration and modify data
 - Use LTE Configuration System to check up data
 - Use LTE Configuration System to export data

Training Content

OEB60 eNodeB V100R006 Product Description

- eNodeB LTE FDD V100R006 Product Description
 - eNodeB System Overview
 - eNodeB System Structure
 - eNodeB Auxiliary Devices
 - eNodeB Typical Networking

OEB63 eNodeB V100R006 Equipment Commissioning

- eNodeB LTE V100R006 Equipment Commissioning
 - eNodeB Commissioning Overview
 - eNodeB Remote Commissioning on the M2000

OEB64 eNodeB V100R006 Operation

- eNodeB LTE V100R006 Operation
 - Structure of operation and maintenance system
 - Login eNodeB O&M system
 - eNodeB equipment management
 - eNodeB transport management
 - eNodeB radio management
 - Backup eNodeB configuration file, query eNodeB version
 - Tracing and real time monitoring

-
- eNodeB LTE V100R006 Operation Praticce Guide
 - Practise on eNodeB operation
- OEB65 eNodeB V100R006 Initial Configuration
- eNodeB LTE V100R006 Data Introduction for Initial Configuration
 - eNodeB Data Configuration Introduction
 - Common Data Parameters Introduction
 - Data Preparation in Specific Scenarios
 - eNodeB LTE V100R006 Initial Configuration by MML Practice Guide
 - Practise on
 - a).eNodeB data configuration preparation
 - b).MML for common data
 - c).MML for device data
 - d).MML for transmission data
 - e).MML for radio data
 - f).MML for specific scenario
 - eNodeB LTE V100R006 Initial Configuration by CME
 - eNodeB Data Configuration by CME Introduction
 - Preparing eNodeB Data
 - Creating eNodeB Data
 - Adjusting eNodeB Data
 - Checking eNodeB Data
 - Exporting eNodeB Data
 - eNodeB LTE V100R006 Initial Configuration by CME Practice Guide
 - Practise on eNodeB data configuration file preparation by CME

Duration

5 working days

Class Size

Min 6, Max 12

1.6.9 LTE eRAN6.0 Reconfiguration Training

Training Path

eNodeB V100R006 Reconfiguration		
OEB67	Lecture, Lab	1d

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE System Overview
- eNodeB LTE V100R005 Product Description

Objectives

On completion of this program, the participants will be able to:

- Outline CME/MML operation
- Perform capacity expansion
- Perform adding an FDD cell
- Perform changing the cell bandwidth
- Perform adding an MME Connection
- Perform adding an S-GW Connection
- Perform network reconstruction
- Perform changing the cell EARFCNs
- Perform changing the Cell PCI
- Perform changing the Cell ID
- Perform relocating an MME
- Perform relocating an S-GW

Training Content

OEB67 eNodeB V100R006 Reconfiguration

- eNodeB LTE V100R006 Reconfiguration
 - CME/MML Command Operation Instructions
 - Capacity Expansion
 - Adding an FDD Cell
 - Changing the Cell Bandwidth
 - Adding an MME Connection
 - Adding an S-GW Connection

-
- Network Reconstruction
 - Changing the Cell EARFCNs
 - Changing the Cell PCI
 - Changing the Cell ID
 - Relocating an MME
 - Relocating an S-GW
 - eNodeB LTE V100R006 Reconfiguration Practice Guide
 - Practise on eNodeB V100R006 reconfiguration

Duration

1 working day

Class Size

Min 6, Max 12

1.6.10 LTE eRAN6.0 Troubleshooting Training

Training Path

eNodeB V100R006 Troubleshooting		
OEB66	Lecture, Lab	2d

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE System Overview
- eNodeB LTE V100R006 Product Description
- eNodeB LTE V100R006 Reconfiguration

Objectives

On completion of this program, the participants will be able to:

- Outline the procedure of eNodeB troubleshooting flow
- Perform the alarm management and analysis
- Perform the log collection
- Draw hardware fault handling procedure
- Handle with the main faults of device level
- Draw transport fault handling procedure
- Handle with the main faults of transport level
- Draw radio fault diagnosis process
- Check the eNodeB radio configuration
- Check quality on the air interface
- Check the EPC configuration
- Handle with the main faults of radio level

Training Content

OEB66 eNodeB V100R006 Troubleshooting

- eNodeB LTE V100R006 Troubleshooting
 - The procedure of eNodeB troubleshooting flow
 - The alarm management and analysis
 - The log collection
 - The main faults processing of device level
 - The main faults processing of transport level

-
- The main faults processing of radio level
 - eNodeB LTE V100R006 TOPN Alarm Handling
 - The TOP N alarms are picked from the engineering projects. By presenting the description, system impact, possible causes, and handling procedure of the TOP N alarms, give an overview of how to recognize and analyze alarms. Finally, cases about alarms handling are given for trainees to have a reference in practical maintenance work about alarms.
 - LTE Troubleshooting Practice Guide Student Book (LTEStar6.0)
 - LTE common fault analysis methods and process steps
 - Help trainees understand LTEStar troubleshooting process and grasp LTEStar troubleshooting methods through practise

Duration

2 working days

Class Size

Min 6, Max 12

1.6.11 LTE eRAN6.0 Product Delta Training

Training Path

LTE eRAN6.0 Product Delta		
OEB68	Lecture	1d

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE Air Interface
- LTE Protocols and Procedures
- eNodeB V100R005 Data Configuration
- LTE eRAN3.0 Features and Algorithms

Objectives

On completion of this program, the participants will be able to:

- Describe LMT delta functions
- Describe M2000 client delta functions

Training Content

OEB68 LTE eRAN6.0 Product Delta

- eNodeB LTE V100R006 Delta for Hardware
 - LMT Delta Functions
 - M2000 Delta Functions
- eNodeB LTE V100R006 Delta for O#M
 - Change in O
 - M between eRAN3.0 and eRAN6.0
 - Change in radio configuration from eRAN3.0 to eRAN6.0
 - Change in transport EP mode configuration from eRAN3.0 to eRAN6.0
- eNodeB LTE V100R006 Delta for O#M Practice Guide
 - Complete eRAN6.0 radio configuration task
 - Complete eRAN6.0 transport EP mode configuration tasks

Duration

1 working day

Class Size

Min 6, Max 12

1.6.12 LTE eRAN6.0 Transmission Features and Algorithms Training

Training Path

LTE eRAN6.0 Transmission Features and Algorithms		
OET68	Lecture	1d

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:
- eNodeB V100R005 Initial Configuration

Objectives

On completion of this program, the participants will be able to:

- Introduction TRM Algorithms
- Explain transport Resource Configurations and Mapping
- Describe Transport Load Control
- Describe Transmission Security principle
- Explain Transmission Security Mechanisms
- Outline LTE synchronization
- Describe frequency and time synchronization
- List synchronization sources
- Describe working modes of clocks
- Perform synchronization configuration

Training Content

OET68 LTE eRAN6.0 Transmission Features and Algorithms

- LTE eRAN6.0 Transmission Security Feature
 - Overview of Transmission Security
 - End-to-End Certificate Management
 - Transmission Security Mechanisms
 - When to Use Transmission Security
 - Transmission Security Deployment
- LTE eRAN6.0 Transport Resource Management Feature
 - Overview of TRM Algorithms
 - Transport Resource Configurations and Mapping

-
- Transport Load Control
 - Engineering Guidelines of TRM
 - LTE eRAN6.0 Synchronization
 - Overview of LTE Synchronization
 - Frequency and Time Synchronization
 - Synchronization Sources
 - Selection of Synchronization Sources
 - Working Modes of Clocks
 - Synchronization Configuration
 - Synchronization Activation Observation
 - Synchronization Fault Troubleshooting

Duration

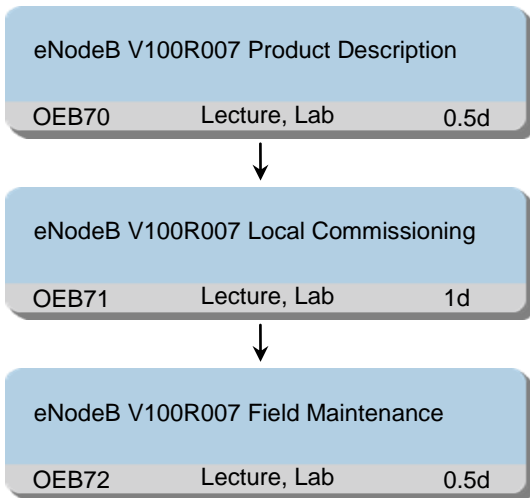
1 working day

Class Size

Min 6, Max 12

1.6.13 LTE eRAN7.0 Field Maintenance Training

Training Path



Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE System Overview

Objectives

On completion of this program, the participants will be able to:

- Describe the hardware structure of eNodeB
- Describe the logical structure of eNodeB
- Describe the working principle and functions of eNodeB boards
- Describe the procedure of eNodeB local commissioning
- Describe the related concept of eNodeB software and configuration file
- Querying the current version of eNodeB
- Use USB disk to commission the eNodeB
- Commission the eNodeB through LMT
- Verify commissioning result
- Describe power and monitoring device
- Perform local data configuration on power and monitoring device
- Power up/down the eNodeB and connect up LMT to the node
- Find the alarm list of eNodeB
- Perform corrective and preventive maintenance on eNodeB

-
- Find faulty hardware units and replace them

Training Content

OEB70 eNodeB V100R007 Product Description

- eNodeB LTE FDD V100R007 Product Description
 - eNodeB System Overview
 - eNodeB System Structure
 - eNodeB Auxiliary Devices
 - eNodeB Typical Networking

OEB71 eNodeB V100R007 Local Commissioning

- eNodeB LTE V100R007 Local Commissioning
 - eNodeB Commissioning Overview
 - eNodeB Local Commissioning through the USB Disk
 - Procedure for the Local Commissioning through the USB Disk
 - Download and Activate the Software and Data Configuration File
 - eNodeB Local Commissioning on the LMT
 - Prepare for the Local eNodeB Commissioning on the LMT
 - Upgrade the eNodeB Software and Data Configuration File on the LMT
 - Download the License on the LMT
 - Query the Running Status
 - Establish an OM Link Between the U2000 and the eNodeB

OEB72 eNodeB V100R007 Field Maintenance

- eNodeB LTE V100R007 Power Supply and Monitoring
 - Basic Concepts about Power and Monitor System
 - Component of Power Supply System
 - Data configuration of Power System
 - Component of Monitor System
 - Data configuration for Monitor System
- eNodeB LTE V100R007 Field Maintenance
 - Powering up/down the eNodeB and connect up LMT to the node
 - Finding the alarm list of eNodeB
 - Perform corrective and preventive maintenance on eNodeB
 - Finding Faulty Hardware units and replace them

Duration

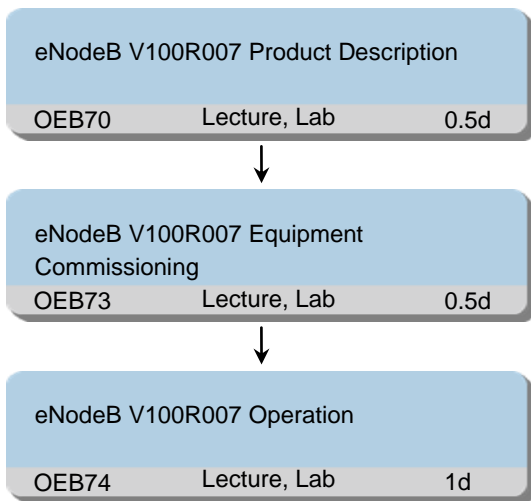
2 working days

Class Size

Min 6, Max 12

1.6.14 LTE eRAN7.0 Commissioning and Operation Training

Training Path



Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE System Overview

Objectives

On completion of this program, the participants will be able to:

- Describe the hardware structure of eNodeB
- Describe the logical structure of eNodeB
- Describe the working principle and functions of eNodeB boards
- Explain the architecture and components of eNodeB operation and maintenance system
- Install LMT software
- Install U2000 client software
- Use LMT login eNodeB
- Use U2000 client Login U2000 server and eNodeB
- Execute MML in single mode
- Execute MML in batch mode
- Manage alarms of eNodeB
- Manage device, such as querying board states, blocking board and unblocking board
- Manage software, such as querying current software version and backup configuration file

-
- Manage transport data, such as querying IP address of Ethernet port and querying IP route
 - Manage radio data, such as querying cell states and querying neighbor cell
 - Manage tracing message, for example: creating a tracing task, checking tracing result, saving result
 - Manage real-time monitoring, for example: creating a monitoring task, checking and saving monitoring result
 - Describe the procedure of eNodeB commissioning
 - Describe the related concept of eNodeB software and configuration file
 - Querying the current version of eNodeB
 - Commission the eNodeB through U2000
 - Verify commissioning result

Training Content

OEB70 eNodeB V100R007 Product Description

- eNodeB LTE FDD V100R007 Product Description
 - eNodeB System Overview
 - eNodeB System Structure
 - eNodeB Auxiliary Devices
 - eNodeB Typical Networking

OEB73 eNodeB V100R007 Equipment Commissioning

- LTE eRAN7.0 Automatic OMCH Establishment
 - Automatic OMCH establishment phase during base station deployment by PnP
 - DHCP introduction
 - Schemes for Obtaining VLAN Information
 - Procedure for Obtaining Configuration Information in different Scenarios
- eNodeB LTE V100R007 Equipment Commissioning
 - eNodeB Commissioning Overview
 - eNodeB Remote Commissioning on the U2000

OEB74 eNodeB V100R007 Operation

- eNodeB LTE V100R007 Operation
 - Structure of operation and maintenance system
 - Login eNodeB OM system
 - eNodeB equipment management
 - eNodeB transport management
 - eNodeB radio management
 - Backup eNodeB configuration file, query eNodeB version
 - Tracing and real time monitoring
- eNodeB LTE V100R007 Operation Practice Guide
 - Practise on eNodeB operation

Duration

2 working days

Class Size

Min 6, Max 12

1.6.15 LTE eRAN7.0 Initial Configuration Training

Training Path

eNodeB V100R007 Initial Configuration		
OEB75	Lecture, Lab	3d

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE System Overview
- eNodeB V100R007 Product Description

Objectives

On completion of this program, the participants will be able to:

- Outline the procedure of eNodeB data configuration
- Implement initial data configuration by MML
- Describe the main table of "eNodeB Summary Data"
- Implement initial data configuration by CME

Training Content

OEB75 eNodeB V100R007 Initial Configuration

- eNodeB LTE V100R007 Data Introduction for Initial Configuration
 - eNodeB Data Configuration Introduction
 - Common Data Parameters Introduction
 - Data Preparation in Specific Scenarios
- eNodeB LTE V100R007 Initial Configuration by MML Practice Guide
 - Practise on eNodeB data configuration preparation
 - Practise on MML for common data
 - Practise on MML for device data
 - Practise on MML for transmission data
 - Practise on MML for radio data
 - Practise on MML for specific scenario
- eNodeB LTE V100R007 Initial Configuration by CME
 - eNodeB Data Configuration by CME Introduction

-
- Preparing eNodeB Data
 - Creating eNodeB Data
 - Adjusting eNodeB Data
 - Checking eNodeB Data
 - Exporting eNodeB Data
 - eNodeB LTE V100R007 Initial Configuration by CME Practice Guide
 - Practise on eNodeB data configuration file preparation by CME

Duration

3 working days

Class Size

Min 6, Max 12

1.6.16 LTE eRAN7.0 Reconfiguration Training

Training Path

eNodeB V100R007 Reconfiguration		
OEB77	Lecture, Lab	2d

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE System Overview
- eNodeB LTE V100R007 Product Description

Objectives

On completion of this program, the participants will be able to:

- Outline CME/MML operation
- Perform capacity expansion
- Perform adding an FDD cell
- Perform changing the cell bandwidth
- Perform adding an MME Connection
- Perform adding an S-GW Connection
- Perform network reconstruction
- Perform changing the cell EARFCNs
- Perform changing the Cell PCI
- Perform changing the Cell ID
- Perform relocating an MME
- Perform relocating an S-GW

Training Content

OEB77 eNodeB V100R007 Reconfiguration

- U2000-CME V200R014 Introduction
 - CME Overview Introduction
 - Features of the CME
 - ◇ Area Management
 - ◇ Template Management
 - ◇ Feature OM Management
 - ◇ Data Check

-
- ◇ Script Executor
 - ◇ Data Fallback
 - CME Configuration Scenarios
 - ◇ Base Station Initial Configuration
 - ◇ Network Reconfiguration
 - eNodeB LTE V100R007 Reconfiguration
 - Reconfiguration Working Flow
 - Reconfiguration Tools and Operation
 - Radio/Device Data Reconfiguration
 - Data Reconfiguration in Typical Scenarios
 - Practise on reconfiguration based on given radio/device data environment

Duration

2 working day

Class Size

Min 6, Max 12

1.6.17 LTE eRAN7.0 Troubleshooting Training

Training Path

eNodeB V100R007 Troubleshooting		
OEB76	Lecture, Lab	2d

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE System Overview
- eNodeB LTE V100R007 Product Description
- eNodeB LTE V100R007 Reconfiguration

Objectives

On completion of this program, the participants will be able to:

- Outline the procedure of eNodeB troubleshooting flow
- Perform the alarm management and analysis
- Perform the log collection
- Draw hardware fault handling procedure
- Handle with the main faults of device level
- Draw transport fault handling procedure
- Handle with the main faults of transport level
- Draw radio fault diagnosis process
- Check the eNodeB radio configuration
- Check quality on the air interface
- Check the EPC configuration
- Handle with the main faults of radio level

Training Content

OEB76 eNodeB V100R007 Troubleshooting

- eNodeB LTE V100R007 Troubleshooting
 - The procedure of eNodeB troubleshooting flow
 - The alarm management and analysis
 - The log collection
 - The main faults processing of device level
 - The main faults processing of transport level

-
- The main faults processing of radio level
 - eNodeB LTE V100R007 TOPN Alarm Handling
 - The TOP N alarms are picked from the engineering projects. By presenting the description, system impact, possible causes, and handling procedure of the TOP N alarms, give an overview of how to recognize and analyze alarms. Finally, cases about alarms handling are given for trainees to have a reference in practical maintenance work about alarms.
 - LTE Troubleshooting Practice Guide Student Book (LTEStar6.0)
 - LTE common fault analysis methods and process steps
 - Help trainees understand LTEStar troubleshooting process and grasp LTEStar troubleshooting methods through practise

Duration

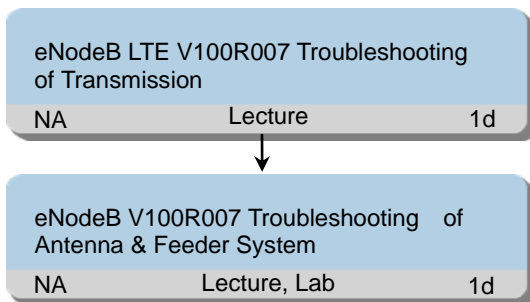
2 working days

Class Size

Min 6, Max 12

1.6.18 LTE eRAN7.0 Advanced Troubleshooting Training

Training Path



Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE System Overview
- eNodeB LTE V100R007 Product Description
- eNodeB LTE V100R007 Reconfiguration

Objectives

On completion of this program, the participants will be able to:

- Outline the procedure of eNodeB troubleshooting flow
- Perform the alarm management and analysis
- Draw hardware fault handling procedure
- Handle with the main faults of device level
- Draw transport fault handling procedure
- Handle with the main faults of transport level
- Draw radio fault diagnosis process
- Check the eNodeB radio configuration
- Handle with the main faults of radio level
- Understand Antenna & Feeder system working principle
- Understand PIM fault and perform troubleshooting by U2000 and WebLMT
- Understand VSWR fault and perform troubleshooting by U2000 and WebLMT
- Understand TMA fault and perform troubleshooting by U2000 and WebLMT

Training Content

NA eNodeB V100R007 Troubleshooting of Transmission

- eNodeB LTE V100R007 Troubleshooting of Transmission

- eNodeB LTE V100R007 troubleshooting of transmission

NA eNodeB LTE V100R007 Troubleshooting of Antenna & Feeder System

- Basic Introduction to Antenna and Feeder
 - Antenna & Feeder System Components Overview
 - Antenna Basic Knowledge
 - Feeder and Jumper
- eNodeB LTE V100R007 Antenna & Feeder System Fault Analysis and Troubleshooting
 - LTE Antenna & Feeder System Fault Overview
 - PIM Interference
 - VSWR Fault
 - TMA Fault.
- eNodeB LTE V100R007 Antenna & Feeder System Fault Analysis and Troubleshooting Trainee Manual
 - Practice on Offline VSWR Test by U2000 and WebLMT
 - Practice on DTF Test of the Antenna VSWR by U2000 and WebLMT
 - Practice on Crossed Pair Detection by U2000 and WebLMT
 - Practise on 2-Tone-based Intermodulation Detection by U2000 and WebLMT
 - Practise on Service-based Intermodulation Detection by U2000 and WebLMT
 - Practise on DTP Test by U2000 and WebLMT

Duration

2 working days

Class Size

Min 6, Max 12

1.6.19 LTE eRAN7.0 Product Delta Training

Training Path

LTE eRAN7.0 Product Delta		
OEB78	Lecture	1d

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer

Prerequisites

- Successful completion of the following courses:
- LTE eRAN6.0 Operation and Configuration Training

Objectives

On completion of this program, the participants will be able to:

- Describe eRAN7.0 new hardware
- Describe eRAN7.0 new O&M functions and feature
- Describe multi-BBU interconnection feature
- Describe USU hardware and its implementation in multi-BBU interconnection feature

Training Content

OEB78 LTE eRAN7.0 Product Delta

- eNodeB LTE V100R007 Delta for Hardware
 - LMT Delta Functions
 - U2000 Delta Functions
- eNodeB LTE V100R007 Delta for O&M
 - Change in O&M between eRAN6.0 and eRAN7.0
- eNodeB LTE V100R007 BBU Interconnection
 - Multi-BBU interconnection feature
 - USU hardware introduction

Duration

1 working day

Class Size

Min 6, Max 12

1.6.20 LTE eRAN7.0 Transmission Features and Algorithms Training

Training Path

LTE eRAN7.0 Transmission Features and Algorithms		
OET78	Lecture	1.5d

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Network Design Engineer

Prerequisites

- Successful completion of the following courses:
- eNodeB V100R007 Product Description

Objectives

On completion of this program, the participants will be able to:

- Explain TRM features and algorithms
- Explain transmission security solution
- Explain synchronization solution
- Explain S1/X2 Self-Management feature and algorithms
- Explain Automatic OMCH Establishment feature

Training Content

OET78 LTE eRAN7.0 Transmission Features and Algorithms

- LTE eRAN7.0 Transmission Security Feature
 - Overview of Transmission Security
 - End-to-End Certificate Management
 - Transmission Security Mechanisms
 - When to Use Transmission Security
 - Transmission Security Deployment
- LTE eRAN7.0 Transport Resource Management Feature
 - Overview of TRM Algorithms
 - Transport Resource Configurations and Mapping
 - Transport Load Control
 - Engineering Guidelines of TRM
- LTE eRAN7.0 Synchronization
 - Overview of LTE Synchronization
 - Frequency and Time Synchronization

-
- Synchronization Sources
 - Selection of Synchronization Sources
 - Working Modes of Clocks
 - Synchronization Configuration
 - Synchronization Activation Observation
 - Synchronization Fault Troubleshooting
 - LTE eRAN7.0 S1/X2 Self-Management
 - Self-Management Overview
 - S1 Interface Self-Management in Generic Scenarios
 - S1 Interface Self-Management in IPSec-enabled Scenarios
 - X2 Interface Self-Management in Generic Scenarios
 - X2 Interface Self-Management in IPSec-enabled Scenarios
 - LTE eRAN7.0 Automatic OMCH Establishment
 - Automatic OMCH establishment phase during base station deployment by PnP
 - DHCP introduction
 - Schemes for Obtaining VLAN Information
 - Procedure for Obtaining Configuration Information in different Scenarios

Duration

1.5 working day

Class Size

Min 6, Max 12

1.7 WBT

1.7.1 LTE SAE System Overview(WBT)

Training Path

LTE SAE System Overview(WBT)		
OEA00	Lecture	4h

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Basic knowledge of mobile communications

Objectives

On completion of this program, the participants will be able to:

- Summarize the evolution of 3GPP releases
- Explain the logical architecture of EPS (E-UTRAN and EPC)
- Give an overview of the interfaces in EPS
- Describe the Evolved Packet Core (EPC)
- Describe the role of the MME and the S-GW
- Describe the S1, X2 and radio-interface and their protocol stacks
- Describe the radio interface techniques used in uplink and downlink
- Describe the channel structure of the radio interface
- Describe the time-domain and Frequency-domain structure in the radio interface in UL and DL for both FDD and TDD mode
- Have a good understanding of the OFDM principle, signal generation and processing
- Detail the reference symbols in DL
- Describe MIMO technology
- Have a good understanding of the SC-FDMA principle, signal generation and processing
- Describe Huawei eNodeB Family
- Describe Huawei LTE products and application scenarios
- Describe Huawei LTE products Operation and Maintenance System

Training Content

OEA00 LTE SAE System Overview(WBT)

- LTE SAE System Overview

-
- Network Architecture
 - Evolution of Cellular Networks
 - 3GPP Releases
 - E-UTRAN Architecture
 - E-UTRAN Interfaces and Protocols
 - EPC Architecture
 - EPC Interfaces and Protocols
 - LTE Air Interface Principles
 - Radio Interface Techniques
 - Principles of OFDM
 - LTE Channel Structures
 - LTE Frame Structure
 - Downlink OFDMA
 - Uplink SC-FDMA
 - Multiple Input Multiple Output
 - Multimedia Broadcast Multicast Service
 - eNodeB Product Overview
 - The Huawei eNodeB family
 - Products and application scenarios
 - Operation and Maintenance

Duration

4 hours

1.7.2 LTE in a Nutshell (WBT)

Training Path

LTE in a Nutshell (WBT)		
OEA01	Lecture	0.5h

Target Audience

System Engineer
Service Engineer
Service Planning Engineer
Service Design Engineer
Network Design Engineer

Prerequisites

- Basic knowledge of mobile communications

Objectives

On completion of this program, the participants will be able to:

- Describe the state of wireless networks and trends for next generation wireless networks
- Sketch the System Architecture Evolution (SAE) for LTE and its interfaces
- Describe OFDM concepts and how it is used in LTE
- Define the key features of the LTE air interface
- Walk through the mobile device operations from power-up to service setup
- Explain how uplink and downlink traffic are handled in LTE networks
- Walk through a high level service flow setup on an end-to-end basis
- Explain deployment scenarios of LTE networks

Training Content

OEA01 LTE in a Nutshell (WBT)

- LTE in a Nutshell
 - State of wireless networks and trends for next generation wireless networks
 - System Architecture Evolution (SAE) for LTE and its interfaces
 - OFDM concepts
 - Key features of the LTE air interface
 - Uplink and downlink traffic are handled in LTE networks
 - High level service flow setup on an end-to-end basis
 - Deployment scenarios of LTE networks

Duration

0.5 hour