Customer Training Catalog
Course Descriptions
CDMA Product Technology Training
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# 1.1 Training Course Descriptions

CDMA Product Technology Training  

Courses are designed as follows:

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1.2 CDMA Training Course Descriptions

1.2.1 ORA01 cdma2000 1X System Principle

Objectives

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

- Describe the development of mobile system.
- List the structure of cdma2000 1X network.
- State the signal processing flow of cdma2000 1X.
- State the key technology of cdma2000 1X.
- Describe the air interface of cdma2000 1X.
- Describe the numbers in cdma2000 1X.

Target Audience

All Technical Personnel

Prerequisites

- Basic knowledge of mobile communications

Content

- Basic Knowledge
- Basic Concepts of Signal and System
- Multiple Access Principle

- Signal Process Flow
- Key Technology
- Power control
- Rake Receiver
- Soft handoff
- Air interface
- IS95A/B air interface
- CDMA2000 air interface
- Initialization Process
- Important Numbers

Training Methods

Lectures, workshop

Duration

1 working day

Class Size

Min 6, max 12
1.2.2 ORA02 cdma2000 1X / EV-DO Rev.A System Overview

Objectives

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

- Describe various wireless communication protocol and evolution of cdma2000.
- Describe Long code, Short code and Walsh code application.
- Describe the reverse and forward Radio Configurations and their correspondence.
- Describe Rake receiver, power control, soft and softer handoffs.
- List feature and specifications of 1xEV-DO Rev.A.
- List Basic Concept of 1xEV-DO Rev.A.
- Describe 1xEV-DO Rev.A networking.
- List 1xEV-DO Rev.A new technology.

Target Audience

All Technical and non-Technical Personnel, Management team, Sales Team

Prerequisites

- Basic knowledge of mobile communications

Content

- cdma2000 1X Overview
- CDMA High Lights
- CDMA Technology Features
- EVDO Overview
- Basic Concepts
- Brief Introduction of Air Interface
- New Technology

Training Methods

Lectures, workshop

Duration

1 working day

Class Size

Min 6, max 12
1.2.3 ORA03 cdma2000 1xEV-DO Rev.A System Principle

Objectives

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

- List basic conceptions of 1xEV-DO Rev.A
- Outline 1xEV-DO Rev.A Air interface
- Describe 1xEV-DO Rev.A key technologies

Target Audience

All Technical Personnel

Prerequisites

- Basic knowledge of mobile communications

Content

- EV-DO Technology Evolution
- Air interface
- Forward link Channel
- Reverse link Channel
- Key Technology
- Virtual Soft Handoff
- HARQ
- Packet Division Multiple Access
- Rate Control
- Key Conception

Training Methods

Lectures, workshop

Duration

1 working day

Class Size

Min 6, max 12
1.2.4 ORC01 BSC6680/BTS3900 CDMA BSS6.0 Product Overview

Objectives

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

- Describe BSC6680 System Architecture.
- Describe BSC6680 Hardware Function.
- Describe BSC6680 Typical Configuration.
- List the typical type of 3900 series BTS.
- Describe the system structure of 3900 series BTS.
- State the function of each module.
- Outline application scenarios.

Target Audience

BSS Field Technicians, First Line Operation and Maintenance Technicians and Engineers

Prerequisites

- Successful completion of the following course(s):
  - ORA02 cdma2000 1X / EV-DO Rev.A System

Content

- BSC6680 System Overview
- BSC6680 Hardware Structure
- BSC6680 System Function
- BSC6680 Typical Configuration
- Overview of the BTS3900
- Structure / Function of each module
- Application Scenarios

Training Methods

Lectures, workshop

Duration

1 working day

Class Size

Min 6, max 12
Objectives

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

- Outline BSC6680 features.
- Describe the structure of BSC6680.
- Describe the functions of all boards.
- Know the signaling flow in BSC6680.
- Describe BSC6680 typical configurations.
- Describe types of 3900 series BTS.
- Outline functions of modules.
- Find typical application scenarios.
- Describe Antenna Functions.
- Describe Antenna Technologies.
- Describe Antenna Installation.

Target Audience

BSS Field Technicians, First Line Operation and Maintenance Technicians and Engineers

Prerequisites

- Successful completion of the following course(s):
  - ORA02 cdma2000 1X / EV-DO Rev.A System Overview course or having basic knowledge on CDMA air interface

Content

- BSC6680 Functions

- BSC6680 Hardware Structure
- BSC6680 Cabinet
- Subrack Configuration
- BSC6680 System Principle
- BSC6680 Logical Structure
- Software Loading Flow
- System Signaling Flow
- BSC6680 Typical Configuration
- Structure of the BTS3900
- Modules Functions
- BBU3900
- RRU3606
- CRFU
- Typical Configuration
- Application Scenario
- Overview of Antenna
- Key Technologies
- Antenna Installation

Training Methods

Lectures, workshop

Duration

2 working days

Class Size

Min 6, max 12
1.2.6 ORC05 BSC6680/BTS3900 CDMA Operation and Maintenance

Objectives

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

- Know about the basic knowledge about ATM/IP.
- Outline the structure of operation and maintenance system.
- Describe IP address in CBSS.
- Describe the networking of the O/M system.
- Describe the software structure of BSS.
- List the file structure of BSC6680 BAM.
- Perform LMT main operation.
- Describe the routine maintenance tasks.
- Fulfill BSC6680 routine maintenance tasks.
- Outline the O/M system of BTS3900.
- Manage the routine maintenance operation of BTS3900.

Target Audience

BSS Field Technicians, First Line Operation and Maintenance Technicians and Engineers

Prerequisites

- Successful completion of the following course(s):
  - ORA02 cdma2000 1X / EV-DO Rev.A System Overview course or having basic knowledge on CDMA air interface
  - ORC02 BSC6680/BTS3900 CDMA V300R006 Product Description course

Content

- Overview of O/M

- LMT Operation
- Monitoring BSS Alarms
- Monitoring BSS Resources
- Monitoring BSS Performance
- Managing Other Resources of BSC
- Routine Maintenance
- Daily Maintenance
- Weekly Maintenance
- Monthly Maintenance
- Half-year Maintenance
- Guide the trainees to complete the operation in the lab exercises
- Operation / Maintenance System
- Remote Operation / Maintenance
- Local Operation / Maintenance
- Reverse Operation / Maintenance
- Routine Operation / Maintenance
- Guide the trainees to complete the operation in the lab exercises
- Overview of Antenna
- Key Technologies
- Antenna Installation

Training Methods

- Lectures, Hands-on Exercise, workshop

Duration

- 2 working days

Class Size

- Min 6, max 12
1.2.7 ORC06 BSC6680/BTS3900 CDMA BSS6.0 Data Configuration

Objectives

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

- Describe the procedure of BSC6680 configuration.
- Make the initial configuration script of BSC6680.
- Implement the data loading and checking of BSC6680.
- Describe the principle and process of BTS data configuration.
- Complete BTS data configuration and commissioning.

Target Audience

BSS Field Technicians, First Line Operation and Maintenance Technicians and Engineers

Prerequisites

- Successful completion of the following course(s):
  - ORA02 cdma2000 1X / EV-DO Rev.A System Overview course or having basic knowledge on CDMA air interface
  - ORC02 BSC6680/BTS3900 CDMA V300R006 Product Description course

Content

- Overview of BSC Data Configuration
- Data Configuration Preparation
- Data Configuration Procedure
- Data Loading
  - Guide the trainees to complete the operation in the lab exercises
- Overview of BTS Data Configuration
- BTS Data Configuration
- BTS Commissioning
  - Guide the trainees to complete the operation in the lab exercises
- BSC Troubleshooting Process and Methods
- Troubleshooting the Transmission
- Introduction to the Transmission
- Troubleshooting the Abis Interface Link
- Troubleshooting the A1/A2 Interface Link Failures
- Troubleshooting the Clock Failures
- Troubleshooting the OM Failures
  - Guide the trainees to complete the operation in the lab exercises
- BTS3900 Emergency Maintenance
- BTS3900 Troubleshooting
- Troubleshooting procedure
- Troubleshooting the Startup Process
- Troubleshooting the Clock Failures
- Troubleshooting the BTS RF
- Troubleshooting the High BER of Link
- Signal loss at Optical Module
- Troubleshooting Process
- Case Study
- Transmission Troubleshooting cases
- Clock Failure cases
- O/M Failure cases
- Service Failure cases

Training Methods

Lectures, Hands-on Exercise, workshop

Duration

5 working days

Class Size

Min 6, max 12
1.2.8  ORC07 BSC6680/BTS3900 CDMA BSS7.0 Data Configuration

Objectives

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

- Describe the procedure of BSC6680 configuration.
- Make the initial configuration script of BSC6680.
- Implement the data loading and checking of BSC6680.
- Describe the principle and process of BTS data configuration.
- Complete BTS data configuration and commissioning.

Target Audience

BSS Field Technicians, First Line Operation and Maintenance Technicians and Engineers

Prerequisites

- Successful completion of the following course(s):
- ORA02 cdma2000 1X / EV-DO Rev.A System Overview course or having basic knowledge on CDMA air interface
- ORC02 BSC6680/BTS3900 CDMA V300R006 Product Description course

Content

- Overview of BSC Data Configuration
- Data Configuration Preparation
- Data Configuration Procedure
- Data Loading
- Guide the trainees to complete the operation in the lab exercises
- Overview of BTS Data Configuration
- BTS Data Configuration
- BTS Commissioning
- Guide the trainees to complete the operation in the lab exercises

Training Methods

Lectures, Hands-on Exercise, workshop

Duration

3 working days

Class Size

Min 6, max 12
1.2.9 ORC08 BSC6680/BTS3900 CDMA Troubleshooting

Objectives

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

- List the basic process of BSC6680 troubleshooting.
- Describe the treatment of typical emergency fault.
- Outline the procedure of the emergency maintenance.
- Understand the processing of troubleshooting.
- Handle the common faults and troubles of CDMA BSS.

Target Audience

BSS Field Technicians, First Line Operation and Maintenance Technicians and Engineers

Prerequisites

- Successful completion of the following course(s):
  - ORA02 cdma2000 1X / EV-DO Rev.A System Overview course or having basic knowledge on CDMA air interface
  - ORC02 BSC6680/BTS3900 CDMA V300R006 Product Description course
  - ORC05 BSC6680/BTS3900 CDMA Operation and Maintenance course
  - ORC06 BSC6680/BTS3900 CDMA V300R006 Data Configuration course

Content

- BSC Troubleshooting Process and Methods
- Troubleshooting the Transmission
- Introduction to the Transmission
- Troubleshooting the Abis Interface Link
- Troubleshooting the A1/A2 Interface Link Failures
- Troubleshooting the Clock Failures
- Troubleshooting the OM Failures
- Guide the trainees to complete the operation in the lab exercises
- BTS3900 Emergency Maintenance
- BTS3900 Troubleshooting
- Troubleshooting procedure
- Troubleshooting the Startup Process
- Troubleshooting the Clock Failures
- Troubleshooting the BTS RF
- Troubleshooting the High BER of Link
- Signal loss at Optical Module
- Troubleshooting Process
- Case Study
- Transmission Troubleshooting cases
- Clock Failure cases
- O/M Failure cases
- Service Failure cases

Training Methods

- Lectures, Hands-on Exercise, case analysis and discussion, workshop

Duration

- 2 working days

Class Size

- Min 6, max 12
1.2.10 ORC10 BSC6680/BTS3900 CDMA BSS8.0 Data Configuration

Objectives

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

- Describe the procedure of BSC6680 configuration.
- Make the initial configuration script of BSC6680.
- Implement the data loading and checking of BSC6680.
- Describe the principle and process of BTS data configuration.
- Complete BTS data configuration and commissioning.

Target Audience

BSS Field Technicians, First Line Operation and Maintenance Technicians and Engineers

Prerequisites

- Successful completion of the following course(s):
  - cdma2000 1X / EV-DO Rev.A System Overview course or having basic knowledge on CDMA air interface
  - BSC6680/BTS3900 CDMA V300R008 Product Description course

Content

- Overview of BSC Data Configuration
- Data Configuration Preparation
- Data Configuration Procedure
- Data Loading
- Guide the trainees to complete the operation in the lab exercises
- Overview of BTS Data Configuration
- BTS Data Configuration
- BTS Commissioning
- Guide the trainees to complete the operation in the lab exercises

Training Methods

- Lectures
- Hands-on Exercise
- Case analysis and discussion
- Workshop

Duration

3 working days

Class Size

Min 6, max 12
1.2.11 ORC11 BSC6680/BTS3900 CDMA BSS8.0 Troubleshooting

Objectives

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

- List the basic process of BSC6680 troubleshooting.
- Describe the treatment of typical emergency fault.
- Outline the procedure of the emergency maintenance.
- Understand the processing of troubleshooting.
- Handle the common faults and troubles of CDMA BSS.

Target Audience

BSS Field Technicians, First Line Operation and Maintenance Technicians and Engineers

Prerequisites

- Successful completion of the following course(s):
  - cdma2000 1X / EV-DO Rev.A System Overview course or having basic knowledge on CDMA air interface
  - BSC6680/BTS3900 CDMA V300R008 Product Description course
  - BSC6680/BTS3900 CDMA Operation and Maintenance course
  - BSC6680/BTS3900 CDMA V300R008 Data Configuration course

Content

- BSC Troubleshooting Process and Methods
- Troubleshooting the Transmission
- Introduction to the Transmission
- Troubleshooting the Abis Interface Link
- Troubleshooting the A1/A2 Interface Link Failures
- Troubleshooting the Clock Failures
- Troubleshooting the OM Failures
- Guide the trainees to complete the operation in the lab exercises
- BTS3900 Emergency Maintenance
- BTS3900 Troubleshooting
- Troubleshooting procedure
- Troubleshooting the Startup Process
- Troubleshooting the Clock Failures
- Troubleshooting the BTS RF
- Troubleshooting the High BER of Link
- Signal loss at Optical Module
- Troubleshooting Process
- Case Study
- Transmission Troubleshooting cases
- Clock Failure cases
- O/M Failure cases
- Service Failure cases

Training Methods

Lectures, Hands-on Exercise, case analysis and discussion, workshop

Duration

2 working days

Class Size

Min 6, max 12
1.2.12 ORP02 cdma2000 1X Radio Network Design and Planning

Objectives

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

- Master the basic knowledge of Radio Propagation.
- Describe some typical Propagation Models and their applicability.
- Comprehend the key parameters and calculation methods of Link Budget.
- Know about the basic principle of Site, Antenna / Feeder Selection.
- Understand interference analysis method.
- Describe the relative factors for capacity.
- Implement the capacity planning.
- List Paging Channel Construction.
- Describe LAC Planning.
- Implement Paging Optimization.
- Describe the basic method for PN offset planning in the CDMA network.
- Outline the basic principle for Neighbor planning in the CDMA network.
- Describe the precautions when planning the PN and the Neighbor cells.

Target Audience

Network Deployment Engineers, System Technicians, System Engineers

Prerequisites

- At least 1 year working experience in CDMA wireless network operation and maintenance
- Successful completion of the following course(s):
  - RA01 cdma2000 1X System Principle Course

Content

- Radio Propagation
- Link Budget
- Propagation Models
- Coverage Balance
- Site, Antenna / Feeder Selection
- Interference analysis
- Reverse link capacity analysis
- Forward link capacity analysis
- Capacity planning
- Paging Channel Construction
- LAC Planning
- Paging Optimization
- PN offset Planning
- PN Assignment
- Neighbor Cell Planning

Training Methods

- Lectures, workshop

Duration

- 3 working days

Class Size

- Min 6, max 12
1.2.13 ORO01 cdma2000 1X Radio Network Optimization

Objectives

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

- Describe the function of the cdma2000 1X configuration message.
- Explain the important elements of the cdma2000 1X configuration message.
- Modify the parameters of configuration message.
- State the significance of power control in CDMA.
- Analyze reverse power control algorithm.
- Analyze forward power control algorithm.
- Optimize power control parameter.
- Describe function and classification.
- Explain some conception related with handoff.
- Apply different handoff algorithm.
- Optimize handoff parameters.
- Describe Registration Process.
- Describe Voice Call Flow.
- Describe Handoff Flow.
- Describe Data Call Flow.
- Describe Huawei performance system structure.
- Know the meaning of performance indexes.
- Analyze abnormal performance indexes.
- Describe process of network optimization.
- Solve typical problems of network.

Target Audience

Optimization Engineers, System Technicians, System Engineers

Prerequisites

- At least 1 year working experience in CDMA wireless network operation and maintenance
- Successful completion of the following course(s):
  - RA01 cdma2000 1X System Principle

Content

- Overview of configuration message
- Classification of configuration message
- Details of configuration message
- Purpose and Principle
- Classification and Application
- Reverse Power Control Algorithm
- Open Loop Power Control
- Closed Loop Power Control
- Forward Power Control Algorithm
- Measurement Report Power Control
- EIB Power Control
- Fast Power Control
- Overview of Handoff
- Soft Handoff Algorithm
- Hard handoff Algorithm
- DT Basic
- Data Analysis
- DT Index Analysis
- Coverage Analysis
- Pilot Pollution Analysis
- Handoff Analysis
- Access Analysis
- Call Drop Analysis
- Cases Analysis
- Interfaces
- Registration Process
- Voice Call Flow
- Handoff
- Data Call Flow
- Key Performance Index
- CS Call Setup Success Ratio
- CS Call Drop Ratio
- Traffic Channel Congestion Ratio
- Intra-BS Soft HO Success Ratio
- Intra-BS Hard HO Success Ratio
- Traffic Density
• Assistant Analysis Index
• Carrier Power Control Measurement
• Carrier Channel Performance Measurement
• Guide the trainees to complete the operation in the lab exercises
• Optimization Process
• Cases of Network Optimization

Training Methods
• Lectures, workshop

Duration
• 7 working days

Class Size
• Min 6, max 12
1.2.14 ORP03 cdma2000 1xEV-DO Rev.A Radio Network Design and Planning

Objectives

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

- Coverage Planning Process.
- Link Budget and Propagation Model.
- Balance between Forward and Reverse Link.
- Describe capacity planning procedure.
- Describe the principle of capacity planning.
- Outline feature of 1X EV_DO capacity planning.
- Describe Subnet Capacity.
- Complete Subnet and Color Code Planning.

Target Audience

Network Deployment Engineers, System Technicians, System Engineers

Prerequisites

- At least 1 year working experience in CDMA wireless network operation and maintenance
- Successful completion of the following course(s):
  - ORA03 cdma2000 1xEV-DO Rev.A System Principle

Content

- Coverage Planning Process
- Link Budget and Propagation Model
- Reverse Link Budget
- Forward Link Budget
- Balance between Forward and Reverse Link
- Capacity Planning Process
- Traffic Model and Capacity Analysis
- Reverse and Forward Capacity Planning
- Reverse Capacity Planning
- Forward Capacity Planning
- Network Update Suggestion
- Basic Concept
- Subnet Capacity
- Subnet and Color Code Planning
- Guide the trainees to complete the operation in the lab exercises

Training Methods

- Lectures, workshop

Duration

- 3 working days

Class Size

- Min 6, max 12
1.2.15 ORO03 cdma2000 1xEV-DO Rev.A Radio Network Optimization

Objectives

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

- Describe the function of 1xEV-DO Rev.A configuration message.
- Explain the important elements of 1xEV-DO Rev.A configuration message.
- Modify the parameters of configuration message.
- Describe the significance of power control in CDMA.
- List reverse power control algorithm.
- List power control data configuration.
- List the handoff algorithm command.
- Apply different handoff algorithms.
- Optimize 1xEV-DO Rev.A handoff parameters.
- Describe signaling procedure of EVDO networking.
- Outline key and messages and parameters.
- Describe rules and methods of EV-DO Performance analysis.
- Understand meaning, statistic and optimization of KPI.

Target Audience

Optimization Engineers, System Technicians, System Engineers

Prerequisites

- At least 1 year working experience in CDMA wireless network operation and maintenance
- Successful completion of the following course(s):
  - ORA03 cdma2000 1xEV-DO Rev.A System Principle
  - ORP03 cdma2000 1xEV-DO Rev.A Radio Network Design and Planning

Content

- Introduction of Configuration Message
- Classification of Configuration Message
- Details of Configuration Message
- Overview
- Reverse Open Loop Power Control
- Reverse Close Loop Power Control
- 1xEV-DO Soft Handoff Algorithm
- 1xEV-DO Hard Handoff Algorithm
- Guide the trainees to complete the operation in the lab exercises
- Registration and Session Setup Procedure
- Connection Setup Procedure
- Handoff Procedure
- Basic Concept
- KPI Analysis
- Session Performance
- Connection Performance
- Mobile Performance
- Coverage Performance
- Capacity Performance
- User Performance
- Key Parameters Checking
- Guide the trainees to complete the operation in the lab exercises
- Optimization Process
- Cases of Network Optimization

Training Methods

Lectures, workshop

Duration

4 working days

Class Size

Min 6, max 12
1.2.16 ORB01 BTS/DBS3900 CDMA Installation and Testing

Objectives
On completion of this course, the participants will be able to:
- Describe Structure of the BTS3900.
- Describe Modules Functions.
- Describe Application Scenario.
- Describe Antenna.
- Describe Key Technologies.
- Complete Antenna Installation.
- Complete Measuring VSWR.
- Complete Locating Antenna-Feeder Fault.
- Describe Precautions and FAQ.
- Complete Operation of Analog PowerMeter.
- Complete Operation of Digital PowerMeter.
- Complete BTS Data Configuration.
- Complete BTS Commissioning.
- Describe Operation / Maintenance System.
- Complete Routine Operation / Maintenance.

Target Audience
BTS Field Technicians, First Line Operation and Maintenance Technicians and Engineers

Prerequisites
- Basic knowledge of mobile communications

Content
- Overview of the BTS3900
- Structure / Function of each module
- Application Scenarios
- Overview of Antenna
- Key Technologies
- Antenna Installation
- DBS3900 Hardware Installation
- Measuring VSWR
- Locating Antenna-Feeder Fault
- Precautions and FAQ
- Guide the trainees to complete the operation in the lab exercises
- Operation of Analog PowerMeter
- Operation of Digital PowerMeter
- Guide the trainees to complete the operation in the lab exercises
- Overview of BTS Data Configuration
- BTS Data Configuration
- BTS Commissioning
- Guide the trainees to complete the operation in the lab exercises
- Operation / Maintenance System
- Remote Operation / Maintenance
- Local Operation / Maintenance
- Reverse Operation / Maintenance
- Routine Operation / Maintenance
- Guide the trainees to complete the operation in the lab exercises

Training Methods
Lectures, Hands-on Exercise, workshop, Multi-media

Duration
4 hours

Class Size
No limit
1.2.17 ORO02 cdma2000 1X Radio Network Optimization Topics

Objectives

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

- Describe Search Windows.
- Complete Neighboring Cell Configuration and Optimization.
- Complete Soft Handoff Optimization.
- Complete Hard Handoff Optimization.
- Complete Coverage Optimization.
- Describe Capacity Expansion.
- Complete Main RRM Tasks.
- Describe Main RRM Algorithms.
- Describe Traffic Balance.
- Describe Idle State Standby Policy.
- Describe Access State Assignment Policy.
- Describe Service State Inter-frequency Hard Handoff Policy.
- Describe Multi-carrier Networking Instances.
- Describe Multi-carrier Optimization Policy.
- Describe Traffic Balance.
- Describe Idle State Standby Policy.
- Describe Access State Assignment Policy.
- Describe Service State Inter-frequency Hard Handoff Policy.
- Describe Multi-carrier Networking Instances.
- Describe Multi-carrier Optimization Policy.
- Describe Call Drop Mechanism and Statistic Analysis.
- Describe Analysis and Solutions for Common Types of Call Drop.
- Describe Network Access Protocols.
- Describe Cause Analysis of Network Access Failures.
- Describe Analysis of and Solutions to a Common Network Access Failure.

Target Audience

Optimization Engineers, System Technicians, System Engineers

Prerequisites

- At least 1 year working experience in CDMA wireless network operation and maintenance
- Successful completion of the following course(s):
  - ORO01 cdma2000 1X Radio Network Optimization

Content

- Introduction to Search Windows
- Neighboring Cell Configuration and Optimization
- Soft Handoff Optimization
- Hard Handoff Optimization
- Overview
- Coverage Optimization
- Common Planning Principles of RF
- Data Service Coverage Policies
- Coverage Optimization Plans and Measures
- Capacity Expansion
- Overview of RRM
- Main RRM Tasks
- Main RRM Algorithms
- Channel Management
- Load Control
- Overview of Traffic Balance
- Idle State Standby Policy
- Access State Assignment Policy
- Service State Inter-frequency Hard Handoff Policy
- Multi-carrier Networking Instances
- Multi-carrier Optimization Policy
- Overview of Traffic Balance
- Idle State Standby Policy
- Access State Assignment Policy
- Service State Inter-frequency Hard Handoff Policy
• Multi-carrier Networking Instances
• Multi-carrier Optimization Policy
• Call Drop Mechanism and Statistic Analysis
• Analysis and Solutions for Common Types of Call Drop
• Call Drop Caused by Poor Regional Coverage
• Call Drop Caused by Pilot Pollution
• Call Drop Caused by Interference on the Forward Channel
• Call Drop Caused by Link Imbalance
• Call Drop Caused by Soft Handoff
• Call Drop Caused by Improper PN Planning

• Network Access Protocols
• Cause Analysis of Network Access Failures
• Analysis of and Solutions to a Common Network Access Failure

Training Methods

Lectures, Hands-on Exercise, workshop

Duration

5 working days

Class Size

Min 6, max 12
1.2.18 ORC09 BSC6680/BTS3900 CDMA Advanced Training

Objectives

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

- Master BSC6680 and BTS3900 CDMA Expansion.
- Master BSC6680 and BTS3900 Interface Reconstruction.
- Master BSC6680 and BTS3900 CDMA Software Upgrade.
- Understand CDMA EV-DO Troubleshooting.
- Understand CDMA interface Troubleshooting.

Target Audience

BSS Field Technicians, First Line Operation and Maintenance Technicians and Engineers

Prerequisites

- At least 2-3 years working experience in CDMA wireless network operation and maintenance

Content

- Introduction to EV-DO Product Faults
- Troubleshooting of EV-DO Faults Case
- Analysis of EV-DO Troubleshooting
- Outline CDMA2000 network interfaces
- Know the procedure of interface troubleshooting
- Introduce the methods for CBSS interface troubleshooting
- Case analysis for interface troubleshooting
- CBSS interface troubleshooting on practice
- CBSS Network Capacity Expansion Overview
- CBSS Network Capacity Expansion Procedure
- CBSS Network Capacity Expansion Scenarios
- CBSS Network Capacity Expansion on practice
- BSC6680 and BTS3900 CDMA Expansion Practice
- Introduce the procedure for A over IP Reconstruction
- Basic knowledge of Data Communication
- Introduce the procedure for IP over FE Reconstruction
- CBSS Interface Reconstruction on practice
- BSC6680 and BTS3900 Interface Reconstruction Practice
- Describe the BSC6680 and BTS3900 upgrade process.
- Upgrade the BSC6680 and BTS3900 software.
- Handle abnormal issues occurred in the upgrade.

Training Methods

- Lectures, Hands-on Exercise, Workshop

Duration

4.5 working days

Class Size

Min 6, max 12
1.2.19 ORA04 CDMA EV-DO Rev.B System Principle

Objectives

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

- EV-DO Evaluation.
- Difference between EV-DO Rev.B and EV-DO Rev.A.
- New Feature of EV-DO Rev.B.
- Key Technology of EV-DO Rev.B.

Target Audience

Optimization Engineers, System Technicians, System Engineers

Prerequisites

- At least 1 year working experience in CDMA wireless network operation and maintenance
- Successful completion of the following course(s):
  - ORO01 cdma2000 1X Radio Network Optimization

Content

- EV-DO Evaluation
- Difference between EV-DO Rev.B and EV-DO Rev.A
- New Feature of EV-DO Rev.B
- Key Technology of EV-DO Rev.B

Training Methods

- Lectures

Duration

- 1 working day

Class Size

- Min 6, max 16
1.2.20 ORC10 CDMA EV-DO Rev.B System Commissioning

Objectives

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

- Describe the evolution of EV-DO version.
- Describe the difference of EV-DO Rev.B and Rev.A.
- Describe the feature of EV-DO Rev.B system.
- Describe the key technology of EV-DO Rev.B system.
- Describe the structure and principle of EV-DO Rev.B system.
- Describe the data configuration procedure of EV-DO Rev.B feature.
- Complete the data configuration of EV-DO Rev.B.

Target Audience

Optimization Engineers, System Technicians, System Engineers

Prerequisites

- At least 1 year working experience in CDMA wireless network operation and maintenance
- Successful completion of the following program(s):
  - CDMA BSS7.0 Product Training

Content

- Structure and Principle of EV-DO Rev.B system
- Data configuration procedure of EV-DO Rev.B feature
- Data configuration of EV-DO Rev.B
- Guide the trainees to complete the operation in the lab exercises

Training Methods

Lectures. Hands-on Exercise

Duration

1 working day

Class Size

Min 6, max 16
1.2.21 ORA05 CDMA-LTE System Overview

Objectives

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

- Describe CDMA-LTE development and features.
- Outline LTE network architecture.
- Explain LTE key technologies.
- Describe LTE protocol and channel.
- Describe LTE deployment.
- Describe CDMA-LTE solution.

Target Audience

Optimization Engineers, System Technicians,
System Engineers

Prerequisites

- Basic knowledge of mobile communications

Content

- CDMA-LTE development and features
- LTE network architecture
- LTE key technologies
- LTE protocol and channel
- LTE deployment
- CDMA-LTE solution

Training Methods

Lectures

Duration

0.5 working day

Class Size

Min 6, max 16
1.2.22 N/A BSC6680/BTS3900 CDMA BSS9.0 Data Configuration

Objectives

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

- Describe the procedure of BSC6680 configuration.
- Make the initial configuration script of BSC6680.
- Implement the data loading and checking of BSC6680.
- Describe the principle and process of BTS data configuration.
- Complete BTS data configuration and commissioning.

Target Audience

BSS Field Technicians, First Line Operation and Maintenance Technicians and Engineers

Prerequisites

- Successful completion of the following course(s):
  - cdma2000 1X / EV-DO Rev.A System Overview course or having basic knowledge on CDMA air interface
  - BSC6680/BTS3900 CDMA V300R009 Product Description course

Content

- Overview of BSC Data Configuration
- Data Configuration Preparation
- Data Configuration Procedure
- Data Loading
- Guide the trainees to complete the operation in the lab exercises
- Overview of BTS Data Configuration
- BTS Data Configuration
- BTS Commissioning
- Guide the trainees to complete the operation in the lab exercises

Training Methods

Lectures, Hands-on Exercise, case analysis and discussion, workshop

Duration

3 working days

Class Size

Min 6, max 16
1.2.23 N/A BSC6680/BTS3900 CDMA BSS9.0 Troubleshooting

Objectives

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

- List the basic process of BSC6680 troubleshooting.
- Describe the treatment of typical emergency fault.
- Outline the procedure of the emergency maintenance.
- Understand the processing of troubleshooting.
- Handle the common faults and troubles of CDMA BSS.

Target Audience

BSS Field Technicians, First Line Operation and Maintenance Technicians and Engineers

Prerequisites

- Successful completion of the following course(s):
  - cdma2000 1X / EV-DO Rev.A System Overview course or having basic knowledge on CDMA air interface
  - BSC6680/BTS3900 CDMA V300R009 Product Description course
  - BSC6680/BTS3900 CDMA Operation and Maintenance course
  - BSC6680/BTS3900 CDMA V300R009 Data Configuration course

Content

- BSC Troubleshooting Process and Methods
- Troubleshooting the Transmission
- Introduction to the Transmission
- Troubleshooting the Abis Interface Link
- Troubleshooting the A1/A2 Interface Link Failures
- Troubleshooting the Clock Failures
- Troubleshooting the OM Failures
- Guide the trainees to complete the operation in the lab exercises
- BTS3900 Emergency Maintenance
- BTS3900 Troubleshooting
- Troubleshooting procedure
- Troubleshooting the Startup Process
- Troubleshooting the Clock Failures
- Troubleshooting the BTS RF
- Troubleshooting the High BER of Link
- Signal loss at Optical Module
- Troubleshooting Process
- Case Study
- Transmission Troubleshooting cases
- Clock Failure cases
- O/M Failure cases
- Service Failure cases

Training Methods

- Lectures, Hands-on Exercise, case analysis and discussion, workshop

Duration

- 2 working days

Class Size

- Min 6, max 16
1.2.24 N/A CDMA-LTE Network Construction Solutions Training

Objectives

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

- Understands the LTE principle and interface technology
- Understands the LTE site construction plan
- Described the CDMA-LTE interoperability principle and process
- Understands LTE wireless network plan main step and method

Target Audience

BSS Field Technicians, First Line Operation and Maintenance Technicians and Engineers

Prerequisites

- Basic knowledge of mobile communications

Content

- CDMA-LTE development and features
- LTE network architecture
- LTE key technologies
- LTE protocol and channel
- LTE deployment
- CDMA-LTE solution
- Huawei LTE solution outline
- Access network system introduction
- Bearer network solution introduction
- Core network system introduction
- CDMA-LTE interoperability network restructuring and solution
- CDMA-LTE idle state interoperability
- CDMA-LTE data service interoperability
- CDMA-LTE pronunciation service interoperability
- CDMA-LTE short message service interoperability
- Introduction the IP applied solutions in the wireless access network
- LTE site construction scenario introduction
- CDMA and LTE collocation site construction
- Antenna and feeder system transforms the construction
- LTE indoor distribution system construction
- CDMA and LTE bearer network construction
- LTE wireless network planning overview
- LTE wireless network coverage and capacity planning
- LTE wireless network cell parameter planning
- LTE indoor coverage planning and indoor system reconstruction
- LTE wireless side device application scenario and typical configuration

Training Methods

Lectures

Duration

5 working days

Class Size

Min 6, max 16
1.2.25 N/A cdma2000 1xEV-DO Rev.A Network Topics Optimization Training

Objectives

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

- Understand the data transmission process.
- Master a roadmap for locating throughput faults.
- Master basic Principles for Troubleshooting.
- Analyze why the RLP data retransmission rate is high.
- Know how to optimize the RLP data retransmission rate.
- Learn troubleshooting principles and methods.
- Understand troubleshooting methods of connection problems.
- Understand troubleshooting methods of call drop problems.
- Understand troubleshooting methods of handoff problems.

Target Audience

Optimization Engineers, System Technicians, System Engineers

Prerequisites

- At least 2 year working experience in CDMA wireless network planning and optimization
- Successful completion of the following course(s):
  - ORA03 cdma2000 1xEV-DO Rev.A System Principle
  - ORP03 cdma2000 1xEV-DO Rev.A Radio

Content

- Data transmission principles
- Causes and Analysis of Low Throughput
- Methods for locating throughput faults
- Principles for Troubleshooting
- Causes and Solutions
- Case Analysis
- Overview
- Principles for Troubleshooting
- Causes and Solutions
- Case Analysis
- Counter Overview
- Principles for Troubleshooting
- Common Causes and Solutions
- Analysis of Connection Problems
- Analysis of Call Drop Problems
- Analysis of Handoff Problems

Training Methods

Lectures

Duration

5 working days

Class Size

Min 6, max 16
1.2.26 N/A CDMA BSS IPRAN Training

Objectives

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

- Master RAN device IP address allocation principles
- Interface board IP address planning and configuration
- Understand the Reliability mechanism of IPRAN
- Understand the principles of reliability detection mechanism and application
- Grasp the basic concept of IP QoS
- Understand and master IPRAN product implementation and application QoS configuration
- Understanding IP transmission Fails troubleshooting
- Understanding IP transmission failure typical case troubleshooting

Target Audience

Network Deployment Engineers, System Technicians, System Engineers

Prerequisites

- Basic knowledge of mobile communications
- At least 1 year working experience in CDMA wireless network operation and maintenance

Content

- IPRAN Network Networking Overview
- IP Protocol Architecture and Implementation
- IPRAN technology comparison and Prospects
- IPRAN Networking Solutions and Concerns
- ATN Network Solutions
- Networking solutions difference between layer 2 and layer 3
- IPRAN networking solutions Features Applications
- IPRAN foundation design overview
- IPRAN Network Planning Overview
- IPRAN basic design and planning
- IPRAN Internet Resource Planning
- IPRAN IP
- subnet planning
- IPRAN route planning
- IPRAN VLAN planning
- IPRAN Internet exchange process
- IPRAN data exchange process
- IPRAN Interconnect Configuration Application
- IPRAN reliability requirements introduction
- IPRAN reliability solutions
- IPRAN reliability parameter configuration
- IPRAN clock applications
- IPRAN clock parameter configuration
- IPRAN QoS Overview
- IPRAN QoS Configuration Application
- IPRAN End to End QoS implementation
- IPRAN operation and maintenance Overview
- IPRAN proactive monitoring programs and the realization
- IPRAN common faults proactively monitor
- IPRAN PING application to use and operation
- IPRAN TRACERT applications to use and operation
- IPRAN capture software to use and operation
- IP Transmission troubleshooting?procedure
- IP transmission failure presentations
- three main methods of isolating IP transmission problems
- IP transmission failure typical case analysis

Training Methods

Lectures. Hands-on Exercise. case analysis and discussion. workshop

Duration

5 working days
Class Size

Min 6, max 16