



Global Services

GSM RAN R12 Training Programs

Catalog of Course Descriptions



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Introduction

Ericsson has developed a comprehensive Training Programs service to satisfy the competence needs of our customers, from exploring new business opportunities to expertise required for operating a network. The Training Programs service is delineated into packages that have been developed to offer clearly defined, yet flexible training to target system and technology areas. Each package is divided into flows, to target specific functional areas within your organization for optimal benefits.

Service delivery is supported using various delivery methods including:

Icon	Delivery Method
	Instructor Led Training (ILT)
	Seminar (SEM)
	Workshop (WS)
	Virtual Classroom Training (VCT)
	Web Based Learning (WBL)
	Short Article (SA)
	Streaming Video (SV)
	CD-ROM (CD)
	Structured Knowledge Transfer (SKT)

Delivery Enablers

	Remote Training Lab (RTL)
	Web Portal (WP)

Ericsson Education E-Learning

	EEOnline @ http://learning.ericsson.net/eeonline/
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GPRS/EGPRS Radio Optimization Workshop



LZU 107 1002 R1A

Description

This course is intended for RF engineers involved in performance optimization activities of GPRS and EGPRS radio networks. The purpose of the course is to provide optimization engineers with both theoretical and practical competence of parameter settings and optimization activities. After attending this course the participants will be able to handle various optimization activities for a GPRS/EGPRS radio network.

Learning objectives

On completion of this course the participants will be able:

- 1 **Detail the GPRS/EGPRS radio network features**
- 2 **Define measurement procedures for GPRS/EGPRS performance monitoring**
- 3 **Detail Ericsson's counter based KPI:s**
- 4 **Detail how to measure GPRS/EGPRS performance using TEMS Investigation**
- 5 **Briefly Detail other Ericsson tools for GPRS/EGPRS performance measurement**
- 6 **Analyze performance indicators related to GPRS/EGPRS**

Target audience

The target audience for this course is: Network Design Engineers, System Engineers.

This audience are professionals working in optimization activities of GPRS/EGPRS radio network.

Prerequisites

The participants should have successfully completed of the following courses:

GSM Radio Network Features

LZU 108 3704

Duration and class size

The length of the course is 3 days and the maximum number of participants is 8.



Learning situation

This is a workshop based on interactive training sessions in a classroom environment.

It includes exercises and practical GPRS/EGPRS optimization cases.

Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Topics in the course	Estimated time
1	<ul style="list-style-type: none">• GPRS/EGPRS radio network features	6 hours
2	<ul style="list-style-type: none">• Introduction to GPRS/EGPRS performance measurements• Ericsson's GPRS/EGPRS KPI:s• TEMS Investigation for GPRS/EGPRS• Measurement procedures using TEMS Investigation	1 hour 2 hours 1 hour 2 hours
3	<ul style="list-style-type: none">• Optimization cases	6 hours

GSM TEMS Investigation Workshop



LZU 107 1003 R1A

Description

Get the initial tuning of a GSM radio network into focus. Through this course, participating radio network engineers will learn to collect and analyze data to tune the network. Common radio-related problems will be analyzed using information from different sources, and analysis of these problems will lead to a deeper understanding of radio-network tuning and result in improved radio-network performance.

Learning objectives

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

- 1 Start TEMS Investigation initiating basic Data Collection following guide lines in student book and TEMS User Guide.**
 - 1.1 List the main applications of the tool
 - 1.2 Connect external equipment
 - 1.3 Start the TEMS data collection application
 - 1.4 Understand the user modes
 - 1.5 Pre-configure workspaces
- 2 Configure completely, create and save Log Files, using TEMS Investigation appropriate tools and checking the resulted log**
 - 2.1 Define recording properties
 - 2.2 Record log files
 - 2.3 Replay log files
 - 2.4 Copy log files
 - 2.5 Export log files
- 3 Establish Cell Definition Files configuration using TEMS Investigation software and validate the configuration by importing TCPUR cells.**
 - 3.1 Create and active the cell definition table
 - 3.2 Import cells from TEMS Cell Planner Universal (TCPUR)
- 4 Activate Main Windows and load the application**
 - 4.1 Configure and Load Main Windows
- 5 Scan selected channels, executing GSM Scanning Procedures and exam the scanned data**
 - 5.1 Identify the scanning strategies
 - 5.2 Select channels to scan
 - 5.3 Perform the scan
 - 5.4 Present the scan data
 - 5.5 Customize the presentation
 - 5.6 Define channels groups
- 6 Verify and set up the Control Functions, building command sequences and controlling the hand set**
 - 6.1 Build command sequences
 - 6.2 Understand the MS properties

- 6.3 Control de hand set manually
- 7 Configure different types of event, executing Event Presentation and check the results of defined events**
- 7.1 Set up user defined events
- 7.2 Present predefined and user defined events
- 7.3 Editing events
- 7.4 Deleting events

Target audience

The target audience for this course is: Service Planning Engineers, Service Design Engineers, Network Design Engineers, Network Deployment Engineers, Service Deployment Engineers, System Engineers, Service Engineers.

Prerequisites

Successful completion of the following flow and course:

GSM Network Fundamentals

FAB 102 1465

GSM Radio Network Features

LZU 108 3704

This audience must have GSM theoretical knowledge and need to know how to apply the TEMS Data Collection on a real field survey.

Duration and class size

The length of the course is 2 days and the maximum number of participants is 8.

Learning situation

This course is based on instructor-led theoretical lessons and practical exercises in a classroom environment.



Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Topics in the course	Estimated time
1	• Course Introduction	0,5 h
	• TEMS Investigation Basics	3,0 h
	• Cell Definition and Log Files	3,0 h
2	• Frequency Scanning	2,0 h
	• Control Functions	1,0 h
	• Event Presentation	3,5 h

AXE Emergency Handling



LZU 108 094 R2A

Description

This course provides the students with the knowledge required to recover the AXE from fault situations in critical parts, including stoppages in the Central Processor.

Learning objectives

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

1 Handle a CP stoppage

- 1.1 Restart / Reload the CP with normal commands
- 1.2 Restart / Reload the CP with CPT commands
- 1.3 Reload the CP without using commands
- 1.4 Test and repair the CP using CPT commands
- 1.5 Give 2 examples of a cause for a stoppage
- 1.6 Interpret an Error Interrupt Printout

2 Handle RP and RPB-S faults

- 2.1 Find an RP using branch, magazine and slot number
- 2.2 Find the equipment controlled by an RP
- 2.3 Repair an RPB-S fault
- 2.4 Disconnect the RPB-S from an APT magazine without causing disturbances for other magazines

3 Handle GS faults for AXE 10

- 3.1 Find the TSM, SPM, CLM boards
- 3.2 Distinguish between DL3, RP and EM Bus cables
- 3.3 Calculate the number of traffic channels in a TSM
- 3.4 Repair a GS fault without disturbing the traffic
- 3.5 Handle GS faults for AXE 810
- 3.6 Find the XDB, DLEB and DLHB boards
- 3.7 Locate the DL2, DL3, DL34, and DL5 links
- 3.8 Calculate the number of traffic channels in XM-0-0
- 3.9 Repair a GS fault without disturbing the traffic

4 Handle problems in the IOG 20

- 4.1 Perform an SP System backup copy to OD
- 4.2 Verify the SP backup on OD
- 4.3 Perform a Hard disk replacement exercise in IOG20

5 Handle problems in the APG 40

- 5.1 Perform a backup of the APG software
- 5.2 Follow the OPI to make a trouble report
- 5.3 Perform a Restore on the APG



Target audience

The target audience for this course is: System Engineer.

Prerequisites

The participants should be familiar with Operation and Maintenance of nodes based on AXE.

Successful completion of the following courses:

GSM Maintenance MSC/BSC Extended
LZU 108 5031/2

Duration and class size

The length of the course is 5 days and the maximum number of participants is 8

Learning situation

The CP and RP modules have instructor-led lessons. The main time is spent on practical group work exercises, using AXE exchanges and tools.

Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Topics in the course	Estimated time
1	• Lesson: CP HW units and buses	3 hours
	• Lesson: Manual recovery procedures	1 hour
	• Lesson: RP & RPB-S	1 hour
	• Exercise: Serial RP Bus	1 hour
2	• Lesson: CP HW fault handling	1 hour
	• Exercise: Error Interrupt printout	1 hour
	• Exercise: CP stoppage	4 hours
3	• Lesson: CP SW fault handling	1 hour
	• Exercise: CP stoppage	3 hours
	• Exercise: Serial RP Bus	2 hours
4	• Exercise: CP stoppage	2 hours
	• Exercise: GS HW layout & fault handling	4 hours
5	• Exercise: SP System Software Backup	1.5 hours
	• Exercise: SP System Backup Verify	0.5 hours
	• Exercise: Replacement of Hard disk in Standby Node	4 hours
	• OR...	
	• Exercise: AP Backup	2 hours
	• Exercise: AP Trouble Report	1 hour
	• Exercise: AP Restore	3 hours

GSM Cell Planning Principles



LZU 108 3273 R6A

Description

Do you want to learn frequency planning and traffic dimensioning? Then this is the course for you. The participants will create a nominal cell plan and gain an basic understanding of the various radio network features.

Learning objectives

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

- 1 Explain the major steps in cell planning**
 - 1.1 Perform traffic and coverage analysis
 - 1.2 Perform nominal Cell Plan
 - 1.3 Discuss surveys
 - 1.4 Discuss System Design and Implementation
 - 1.5 Discuss System Tuning
- 2 Perform power/system balances and macro cell predictions**
 - 2.1 Calculate link budgets and perform a system/power balance
 - 2.2 Derive design criteria for macro cell coverage predictions
 - 2.3 Explain how design criteria relates to coverage predictions and field measurements
- 3 Perform dimensioning of logical channels**
 - 3.1 Perform dimensioning of logical channels in different scenarios
 - 3.2 Perform dimensioning of Location Areas with regard to paging capacity
- 4 Perform dimensioning of logical channels**
 - 4.1 Perform dimensioning of logical channels in different scenarios
 - 4.2 Perform dimensioning of Location Areas with regard to paging capacity
- 5 Discuss different RBS configurations that Ericsson supports**
 - 5.1 Recognize scenarios where a repeater solution might be appropriate
 - 5.2 Explain the function and usage of different types CDUs
 - 5.3 Discuss the different RBS configurations
- 6 Estimate the cell size from a capacity point of view**
 - 6.1 Define the term "traffic"
 - 6.2 Discuss GoS and channel utilization
- 7 Frequency planning**
 - 7.1 List and Detail a number of channel plans such as 3/9 and 4/12 reuse
 - 7.2 Discuss co- and adjacent channel interference
 - 7.3 Define the term re-use distance
- 8 Produce a nominal cell plan**
 - 8.1 Plan for coverage, capacity and low interference in a specific area
- 9 Explain the use of different cell planning tools**
 - 9.1 Detail Ericsson's product portfolio TEMS optimization solution
 - 9.2 Perform data logging and some analysis using TEMS Investigation
 - 9.3 Discuss some basic features of Ericsson's cell planning tool, TEMS CellPlanner Universal



- 9.4 Explain the use of CNA in OSS for the purpose of viewing, reconfiguring, and implementing cells
- 10 Discuss how to increase capacity in an existing network**
- 11 Detail some radio network features**
- 11.1 List and Detail the different processes involved in idle mode
 - o Explain the purpose of the locating algorithm

Target audience

The target audience for this course is radio network engineers and radio network-tuning engineers which require a general understanding of the cell planning process.

Prerequisites

The participants should be familiar with the GSM network or successful completion of the following course:

GSM Network Fundamentals (FAB 102 1465)

Duration and class size

The length of the course is 5 days and the maximum number of participants is 16.

Learning situation

This course is based on theoretical instructor-led lessons and theoretical exercises given in a classroom environment.



Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate. (This paragraph is mandatory).

Day	Topics in the course	Estimated time
1	• Cell planning introduction	1h
	• System description	2h
	• Radio Frequency Guidelines	3h
2	• Traffic	1h
	• Dimensioning of logical channels	3h
	• Frequency planning	2h
3	• Antennas and antenna near products	4h
	• Design case	2h
4	• Design case	4h
	• Site survey	1h
	• Tools	1h
5	• Radio Network Features	3h
	• Network expansion	3h

GSM Cell Planning Workshop



LZU 108 3287 R7A

Description

This course is intended for radio network engineers involved in planning of GSM radio network. The purpose of the course is to provide the participants with extensive theory about cell planning and practical experience from radio network design using cell-planning tools.

Learning objectives

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

1 Perform macro/micro cell predictions

- 1.1 Derive design criteria for macro cell coverage predictions
- 1.2 Explain how design criteria relates to coverage predictions and field measurements

2 Select a frequency planning strategy based on hardware characteristics and available bandwidth

- 2.1 Perform manual frequency planning according to re-use patterns
- 2.2 Perform free frequency planning with an AFP (Automatic Frequency Planner)
- 2.3 Understand MRP-frequency planning (Multiple Re-use Pattern)
- 2.4 Perform FLP-planning (Fractional Load)
- 2.5 Understand how tools in the RNO part in OSS, for example FAS, can provide useful support in frequency planning.

3 Explain the principles behind Ericsson's macro and micro cell propagation prediction models

- 3.1 Explain the principles behind Ericsson's macro cell propagation prediction algorithm 9999 and list the different types of input data the algorithm needs
- 3.2 Explain the principles behind Ericsson's urban model and list the different type of input data the algorithm needs
- 3.3 Perform, and evaluate, an automatic tuning of algorithm 9999

4 Explain situations where the Co-existence of cellular systems might generate problems


- 4.1 Understand the concept of inter-modulation
- 4.2 Understand the "near-far effect"

5 Explain the impact of GPRS/EGPRS on the radio network

- 5.1 Explain the GPRS/EGPRS radio interface
- 5.2 Describe the radio resource handling
- 5.3 Perform GPRS/EGPRS radio network dimensioning

6 Have some basic knowledge related to radio network statistics (STS)

- 6.1 Explain counters related to general traffic information
- 6.2 Knowledge in counters used for GPRS/EGPRS dimensioning

- 
- 7 Explain a number of Radio Network Features related to planning issues**
 - 7.1 Basic knowledge in features like Hierarchical Cell Structures, Multi Band Cell and Synchronized Radio Network
 - 7.2 Understanding in how the features listed above have impact on planning/re-planning of the network
 - 8 Have some experience in using TEMS CellPlanner Universal**
 - 8.1 Design a network with macro cells and create a frequency plan
 - 8.2 Import and use “live” traffic data as input to the Automatic Frequency Planning
 - 8.3 Expand an existing network with new sites for improved coverage and capacity

Target audience

The target audience for this course is radio network engineers working with cell planning issues.

Prerequisites

Successful completion of the following courses:

GSM System Survey	LZU 108 852
GSM Cell Planning Principles	LZU 108 3273
GSM TEMS CellPlanner Universal User	LZU 108 3886

Duration and class size

The length of the course is 5 days and the maximum number of participants is 16.

Learning situation

The course is based on instructor-led lessons with exercises and practical cases using TEMS CellPlanner Universal.



Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Topics in the course	Estimated time
1	• Introduction	0,5h
	• RF-Guidelines	1h
	• Frequency Planning Strategies	3h
	• Ericsson Propagation Algorithms	1h
	• Design Case 1 (Macro Cell Planning)	0,5h
2	• Design Case 1 cont.	6h
3	• Co-existence of Cellular Systems	1h
	• GPRS/EGPRS Dimensioning	4h
	• Design Case 2 (FLP-planning)	1h
4	• Design Case 2 cont.	1h
	• Design Case 3 (Automatic tuning of 9999 model)	2h
	• Radio Network Statistics	2h
	• Radio Network Features	1h
5	• Radio Network Features cont.	3h
	• Design Case 4 (Micro Cell Planning)	2h
	• Evaluation	1h

GSM Radio Network Tuning



LZU 108 3298 R7A

Description

This course is intended for RF engineers involved in tuning activities of GSM networks. The purpose of the course is to provide RF engineers with both theoretical and practical competence of parameter settings and tuning activities. After attending this course the participants will be able to handle various tuning activities for GSM radio networks.

Learning objectives

On completion of this course the participants will be able to

1 Detail the general tuning processes and performance indicators in a GSM network

- 1.1 List different views of quality and which parts generally are considered
- 1.2 Detail some key performance Indicators for accessibility, retainability and service integrity
- 1.3 Define quality in a GSM/GPRS network

2 Plan and dimension a GSM radio network

- 2.1 Calculate design criteria for different environments
- 2.2 Perform coverage acceptance test using TEMS Investigation

3 Tune radio networks

- 3.1 Perform analysis of statistical data and problems
- 3.2 Explain main radio parameters
- 3.3 Perform change of cell borders, hysteresis and offsets
- 3.4 Perform changes of thresholds for HCS, ICHO, CLS and other features
- 3.5 Perform adjustments of SDCCH capacity in a cell
- 3.6 Explain how to dimension the size of a Location Area
- 3.7 Analyze paging performance and perform parameter adjustments related to paging capacity
- 3.8 Perform changes of parameters related to GSM to UMTS handover
- 3.9 Perform tuning of Multi-band cell parameters
- 3.10 Perform tuning of BTS/MS power control and other quality related features

4 Interpret statistics and some key performance indicators

- 4.1 Explain some of the counters that can be retrieved from STS
- 4.2 Calculate some user formulas for the key performance indicators
- 4.3 Analyze and evaluate a number of key performance indicators

5 GPRS/EGPRS Tuning & Optimization

- 5.1 Perform GPRS/EGPRS STS and field measurements
- 5.2 Define level one and level two performance indicators related to GPRS/EGPRS
- 5.3 Analyze performance indicators related to GPRS/EGPRS
- 5.4 Perform changes of GPRS related parameters

6 Explain how to use some of the Ericsson tools used for tuning and optimization

- 6.1 Explain how and when to use PMR (MTR, CTR, CER)
- 6.2 Explain how and when to use RNO (MRR, FAS, FOX, NCS, NOX, TET, SYROX)
- 6.3 Explain how and when to use R-PMO
- 6.4 Explain some of the tools in the TEMS portfolio

Target audience

The target audience for this course is: Network Design Engineers, System Engineers and Service Engineers.

Prerequisites

Successful completion of the following courses:

GSM System Survey
GSM Cell Planning Principles
GSM Radio Network Features

LZU 108 852
LZU 108 3273
LZU 108 3704

Duration and class size

The length of the course is 5 days and the maximum number of participants is 16.

Learning situation

The course is based on instructor-led lessons with exercises and practical radio network tuning cases



Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Topics in the course	Estimated time
1	• Introduction	0,5h
	• Managing the Quality of a Radio Network	2h
	• Coverage	1,5h
	• Parameter repetition I	2h
2	• Parameter repetition I	2h
	• Tuning case I	1h
	• Parameter repetition II	3h
3	• Tuning case II	1h
	• Parameter repetition III	4h
	• Tuning case III	1h
4	• BSC STS User Formulas and Counters	3h
	• Tuning Case IV	1h
	• Tuning Case V	1h
	• GPRS/EGPRS Introduction	1h
5	• GPRS/EGPRS tuning & optimization	3h
	• OSS tools	1h
	• Case VI TEMS Investigation	0,5h
	• Case VII TEMS Visualization	0,5h
	• Post test	1h

GSM Radio Network Features



LZU 108 3704 R8A

Description

Get a grip on GSM Radio Network Features. We will explain the idle mode behavior, the purpose and use of hierarchical cell structures. Frequency hopping and MAIO Management. You will see how the GPRS/EGPRS features are influencing the GSM network.

Learning objectives

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

Module 1

1 Identify and compare basic and indispensable features and discuss their main characteristics using the student material, instructor explanation, class debate and evaluating in theoretical exercises

- 1.1 Understand the Idle Mode behavior of the GSM network
- 1.2 Decide the values of Idle Mode parameters
- 1.3 Explain how the Locating algorithm works of handover candidates
- 1.4 Decide and tune the parameters that controls Locating
- 1.5 Identify the impact other auxiliary radio network features have on Locating
- 1.6 State the Channel Administration process for circuit switched connections
- 1.7 Decide the values of Channel Administration parameters

Module 2

2 Identify and compare optional features and discuss their main characteristics using the student material, instructor explanation, class debate and evaluating in theoretical exercises

- 2.1 Understand the following features: Hierarchical Cell Structures, Assignment to Another Cell, Intra-cell Handover, Cell Load Sharing, Overlaid / Under-laid sub-cell, Multi Band Cell and GSM-UMTS Cell Reselection and Handover.
- 2.2 Identify and explain associated parameters

Module 3

3 Identify and compare quality related features and discuss their main characteristics using the student material, instructor explanation, class debate and evaluating in theoretical

- 3.1 Understand the following features: Frequency Hopping and MAIO Management, Adaptive Multi-rate (AMR), Dynamic Power Control (BTS and MS) and Channel Allocation Optimization
- 3.2 Identify and explain associated parameters

Module 4**4 Identify and compare GPRS/EGPRS features and discuss their main characteristics using the student material, instructor explanation, class debate and evaluating in theoretical**

- 4.1 Understand and explain radio related GPRS/EGPRS terminology
- 4.2 Understand the following features and explain the associated parameters: GPRS/EGPRS Idle Mode, GPRS/EGPRS Channel Administration, GPRS/EGPRS Cell Reselection, GPRS Link Adaptation, EGPRS Link Quality Control, GPRS/EGPRS MS Power Control and GPRS/EGPRS Quality of Service.

Target audience

The target audience for this course is: Network Design Engineers, System Engineers and Service Engineers.

Prerequisites

Successful completion of the following flow and course:

GSM Network Fundamentals	FAB 102 1465
Cell Planning Principles	LZU 108 3273

Duration and class size

The length of the course is 5 days and the maximum number of participants is 16.

The delivery of this course is based on the modules combination as listed below. The proposal of the modules combination is to offer the necessary training in agreement with the nodes acquired by the customer.

Options of modules combination:

Combination:	Module 1	Total duration 1 day
Combination:	Module 1 + 2	Total duration 2,5 days
Combination:	Module 1 + 2 +3	Total duration 3,5 days
Combination:	Module 1 + 2 + 3 + 4	Total duration 5 days

Learning situation

This course is based on theoretical instructor-led lessons given in a classroom environment.



Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Topics in the course	Estimated time
1	• Introduction	0,5 h
	• Basic, indispensable features (Module 1)	5,5 h
2	• Radio Network Starter and Multi-band Package (Module 2)	6,0 h
3	• Radio Network Starter and Multi-band Package (Module 2)	2,0 h
	• Quality related features (Module 3)	4,0 h
4	• Quality related features (Module 3)	2,0 h
	• GPRS/EGPRS features (Module 4)	4,0 h
5	• GPRS/EGPRS features (Module 4)	5,0 h
	• Test	1,0 h

GSM TEMS™ CellPlanner Universal User



LZU 108 3886 R6A

Description

Do you know how to plan a GSM network? Some planners have the software but do not use their complete capacity. During this course you will learn how to use TEMS Cell Planner Universal to plan radio GSM and (E)GPRS network generating coverage, traffic distribution and interference calculation and reports.

Learning objectives

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

- 1 Use TEMS TCPU software executing basic tool configuration and navigating in the main windows..**
 - 1.1 Use the map configuration windows, clutters and datum
- 2 Configure GSM system properties in TEMS TCPU software, using the user guide instruction and parameter description, checking if equipment is loaded.**
 - 2.1 Load a given GSM system and configure the equipment of the GSM network in the project.
- 3 Use TCPU software to perform coverage calculations and evaluate results by generating reports.**
 - 3.1 Calculate coverage using both 9999
 - 3.2 Make coverage reports
- 4 Plan manually network frequency using TCPU software using user guide definition and parameter description.**
 - 4.1 Perform manual frequency planning based on re-use patterns
- 5 Plan network frequency automatically using TCPU software using user guide definition and parameter description.**
 - 5.1 Perform automatic frequency planning based on re-use patterns.
- 6 Apply a generated traffic load by TCPU or imported live traffic and analyze GSM/(E)GPRS traffic**
 - 6.1 Generate traffic internally in the tool
 - 6.2 Import live traffic

- 7 Use the frequency hopping functionality feature of TCPU software by configuring the parameter base on user guide instructions**
 - 7.1 Apply base band frequency hopping
 - 7.2 Produce a fractional load frequency plan which is based on synthesizer frequency hopping
- 8 Generate calculated coverage reports, configuring TCPU software to use different prediction models and evaluate issued results**
 - 8.1 Calculate coverage using the urban prediction models
 - 8.2 Configure the network with feature HCS and calculate coverage and best server prediction.
- 9 Perform an automatic tuning of algorithm 9999 using log files and manual guidelines and parameter description.**
 - 9.1 Import Log Files to be used for the automatic tuning process
- 10 Execute the import and export data process following TCPU user guide instructions.**
 - 10.1 Use the possibility to import and export data, for example from and to OSS via the CNAI interface
- 11 Create scripts and run scripts included in the installation of the TCPU software and check the results.**
 - 11.1 Run a few small scripts for some basic operations like setting up a new project
- 12 Convert maps form for different presentation possibilities in the TCPU software and show the maps configuration.**
 - 12.1 Use the functionality to convert a map from Planet format to Geobox format.

Target audience

The target audience for this course is: Network Design Engineers, Network Deployment Engineers, System Engineers.

Prerequisites

Successful completion of the following flow and course:

GSM Network Fundamentals

FAB 102 1465

GSM Cell Planning Principles

LZU 108 3273

GPRS/EDGE Radio Dimensioning

LZU 108 6647

Duration and class size

The length of the course is 3 days and the maximum number of participants is 8.

Learning situation

This course is based on instructor-led theoretical lessons and practical exercises in a classroom environment.

Time schedule

The time required always depends on the knowledge of the attending participants and the h stated below can be used as estimate.

Day	Short description of the topics in the course	Estimated time
1	<ul style="list-style-type: none"> • Make coverage calculations and manual frequency planning 	6,0 h
2	<ul style="list-style-type: none"> • Produce a frequency plan with the Automatic Frequency Planner • Analyze Traffic • Run frequency hopping in the tool 	2,0 h 2,0 h 2,0 h
3	<ul style="list-style-type: none"> • Use the urban prediction model • Run the automatic tuning function of the 9999 algorithm • Import and export data • Run scripts an convert maps 	2,0 h 2,0 h 1,0 h 1,0 h

GPRS/EDGE Overview (WBL)



LZU 108 3944 R2A

Description

Participants attending the GPRS Overview WBL course will be given a basic introduction to the 2nd generation Systems based on GSM. The GPRS core and radio network extension to the GSM network and possible GPRS services are explained on an overview level. The role of the GPRS nodes in WCDMA networks is discussed as well as the influence of the EDGE to the GPRS air interface. The focus is on general principles rather than specific technical details.

Learning objectives

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

- 1 **Understand the purpose of implementing packet switching in the existing GSM/WCDMA system**
- 2 **Understand how a terminal (Laptop or Smart Phone) uses the GPRS system to access other networks such as corporate LAN or the internet**
- 3 **List and explain GPRS system architecture**
- 4 **Explain on overview level the air interface in GPRS covering the GSM systems and/or WCDMA System**
- 5 **Explain the influence of EDGE to the GPRS network in terms of infrastructure requirements, Air Interface and end-user service enhancements..**

Target audience

The target audience for this course is: Service Planning Engineers, Service Design Engineers, Network Design Engineers, Network Deployment Engineers, Service Deployment Engineers, System Technicians, Service Technicians, System Engineers, Service Engineers,

Prerequisites

The participants should be familiar with mobile telecommunications, especially, it is an advantage to be familiar with the 2G mobile Systems

Duration and class size

The length of the course is 3 hours.

Learning situation

Web-based learning

GPRS BSS Operation



LZU 108 3953 R3A

Description

The purpose of this learning product is to build up competence to perform operational procedures in the BSS of a GPRS Network.

Learning objectives

On completion of this course the participants will be able to

- 1 **Understand the impact of GPRS on the GSM network and the capabilities of the BSS system in relation to Core Network (CN) 3.0**
- 2 **Understand and handle the main categories and exchange properties in the GPRS part of BSC for both Gb over Frame Relay and Gb over IP.**
- 3 **Manage the configuration and operation of GPRS functions in the BSC**
- 4 **Understand the internal software structure and hardware structure of the PCU and the traffic flow for both Gb over Frame Relay and Gb over IP.**
- 5 **Understand and configuration of Gb over Frame Relay and Gb over IP.**

Target audience

The target audience for this course is personnel providing second line O&M support in an OSS environment. It is suitable for configuration management personnel, GSN and BSS support engineers.

Prerequisites

Successful completion of the following courses:

- GSM AXE Operation (LZU 108 5024/2)
- GSM BSC Operation (LZU 108 625)
- GPRS System survey

Duration and class size

The length of the course is two days and the maximum number of participants is 8.

Learning situation

This is an instructor-led training course based on tasks in the work process given in a technical environment using equipment and tools, which can also be accessed remotely.



Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Topics in the course	Estimated time
1	Module 1: Introduction	0.5 hour
	Module 2: Packet Control Unit (PCU)	1.5 hour
	Module 3: GPRS Exchange Hardware	1.5 hour
	Module 4: GPRS Exchange Hardware (Gb over IP)	1.5 hour
	Module 5: Gb over Frame Relay configuration	1 hour
2	Module 6: Gb over IP configuration	1 hour
	Module 7: Radio interface	1 hour
	Module 8: EDGE solution description	0.5 hour
	Module 9: Traffic Flow description	1.5 hour
	Module 10: BSC Exchange properties for GPRS/EGPRS	1 hour
	Module 10: Concepts	10 min

GSM AXE Operation



LZU 108 5024/2 R4A

Description

This task-oriented course will teach you how to operate the functions of the AXE 10 common to all AXE applications of the Core Network and the BSC. Through extensive hands-on training, you will raise your skills level to intermediate.

Learning objectives

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

- 1 **Efficiently make use of command files and log files in daily routines, using the OSS-RC applications Command File Developer and Command Handling.**
- 2 **Fetch exchange related documentation from the system databases.**
- 3 **Explain how the control path is realized in the switch by defining the corresponding units.**
- 4 **Explain how the switching path is implemented by following a call through the GS and setting the necessary exchange data to establish the connections in the node.**
- 5 **Configure hardware for new routes as defined in Customer Product Information (CPI).**
- 6 **Define routes and connect/disconnect devices.**
- 7 **Describe the units and concepts related to # 7 signaling.**
- 8 **Perform system backups (IOG 20 or APG 40).**
- 9 **Handle the file transfer (IOG 20 or APG 40).**
- 10 **Understand and modify the file system of an AXE 10 (IOG 20 or APG 40).**
- 11 **Collect Data on Request as input to Trouble Reports to Ericsson FSC.**
- 12 **Set supervision data on DIP, SNT and SS7.**
- 13 **Modify Size Alteration Events on request from a work order.**
- 14 **Retrieve Statistics from MSC/BSC**
- 15 **Perform changes in the pre-analysis and B-number analysis tables.**
- 16 **Perform changes in the routing analysis table.**
- 17 **Perform changes in the Charging analysis tables.**
- 18 **Analyse EOS and Cause codes.**
- 19 **Trace and solve faults related to the analysis tables.**
- 20 **Handle the charging analysis and charging output.**
- 21 **Solve a Managed Object (MO) Fault upon alarm in the BSC.**
- 22 **Reconfigure MOs and BTSs using the OSS-RC applications Cellular Network.**
- 23 **Administration and Base Station SW management.**
- 24 **Load RBS software using Base Station SW management in OSS-RC.**

Target audience

The target audience for this course is: System Technicians, System Engineers.

Prerequisites

Successful completion of the following training flow:

GSM RAN Network Surveillance
FAB 102 1465

Duration and class size

The length of the course is 9 days and the maximum number of participants is 8.

Learning situation

This is a task-oriented learning course based on tasks in the work process given in a technical environment using equipment and tools, which can also be accessed remotely.

Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Learning Product Plan

The task-oriented course is divided into 3 different modules:

- AXE General module 5 days
- MSC Basic Operation 3 days
- BSC Basic Operation 1 day

GSM Maintenance MSC/BSC Extended



LZU 108 5031/2 R4A

Description

This course is essential for those wishing to practice implementing their hardware maintenance skills and knowledge on the AXE nodes of the GSM MSC/BSC. Having attended previous courses and acquired the prerequisite knowledge, students on this course, work full-time hands-on in a guided environment to put their prerequisite skills into practice.

Upon completion, you will be able to deal with hardware faults on the central elements of the AXE, like Central Processor, Group Switch and APG 40, and follow maintenance routines using system documentation and local operation and maintenance (O&M) tools.

Learning objectives

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

- 1 **Identify hardware components and interconnections of the relevant Group Switch using online and exchange documentation.**
- 2 **Identify the hardware components and interconnections of the Input / Output (IO) configuration, using O&M tools and online documentation.**
- 3 **Detect and solve intermediate level faults in IO hardware, using O&M tools and online documentation.**
- 4 **Access and use IO logging functions in the detection and analysis of system faults, using O&M tools and online documentation.**
- 5 **Access and use IO file processing functions to gather and distribute essential exchange data, using O&M tools and online documentation.**
- 6 **Determine the actions of the Maintenance Subsystem (MAS) in supervising CP hardware and handling CP faults, using O&M tools, exchange printouts, and online documentation.**
- 7 **Determine the MAS actions in CP software supervision and recovery, using O&M tools, online documentation, and direct observation.**
- 8 **Handle CP software recovery alarms, using O&M tools and online documentation.**
- 9 **Handle an intermediate level CP stoppage, using O&M tools, online documentation, and the CP Test (CPT) system.**

Target audience

The target audience for this course is: System Technicians, Field Technicians.

Prerequisites

Successful completion of the following courses/flows:

GSM Network Fundamentals, Blended Training FAB 102 1465

In particular, prior attendance of the following is essential:

GSM Core Network Maintenance
LZU 108 5458/2

Duration and class size

The length of the course is 5 days and the maximum number of participants is 8.

Learning situation

This is a task-oriented learning course based on tasks in the work process given in a technical environment using equipment and tools.

The instructor will act as a facilitator. The students work independently receiving assistance only where necessary. Instances of pure lecturing will be limited. Hence students have an opportunity in this course to implement concepts learned in previously attended prerequisite courses, into practical skills.

GSM RAN Statistics Introduction



LZU 108 5079 R3A

Description

If you need to understand and perform basics Statistics in the GSM Radio Access Network (RAN), this course is for you. You learn overall function of STS. This includes, understand the relationships about the terms “Object Types”, “Objects” and “Counters”, access the different ways to monitor the GSM radio network performance in the areas of accessibility, retainability and speech quality, and identify the Statistics Recording Tools.

Learning objectives

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

- 1 Detail basic traffic theory and engineering concepts.**
- 2 Discuss the overall function of STS**
 - 2.1 Define the terms “Object Types”, “Objects”, and “Counters” and the relationships between each
 - 2.2 Discriminate the process of stepping counters in the BSC
 - 2.3 Explain the process of counter values collection from the different program blocks and storage in STS
- 3 Explain some of the counter that can be retrieved from STS.**
 - 3.1 Clear the relation between several object types and their respective counters
 - 3.2 Define e and briefly Detail the three performance monitor indicators in the radio network
 - 3.3 Demonstrate the different ways how important statistical elements – such as congestion, dropped calls, and availability – can be derived from the counter values, and Detail the characteristics of these results
 - 3.4 List some of the specific radio network features which STS addresses
 - 3.5 Provide and Detail some new object types and counters for GSM R12
 - 3.6 Calculate some user formulas for the key performance indicators.
 - 3.7 Analyze and evaluate a number of Key performance indicators.
- 4 Detail how OSS can be used for statistics recording and list the various tools available**
 - 4.1 Explain the purpose of Mobile Traffic Recording (MTR)
 - 4.2 Discriminate the purpose of Cell Traffic Recording (CTR)
 - 4.3 Discuss the purpose of Channel Event Recording (CER)
 - 4.4 Express the purpose of Measurement Result Recording (MRR)
 - 4.5 Tell the purpose of Radio Interference Recording (RIR)
 - 4.6 Detail the purpose of the Active BA-list Recording (ABAL)
 - 4.7 Identify the purpose of the Real-Time Performance Monitoring (R-PMO)
 - 4.8 Clear the purpose of the Teams Visualization

**Target audience**

The target audience for this course is: Service Planning Engineers, Service Design Engineers, Network Design Engineers.

Prerequisites

Successful completion of the following courses:

GSM Network Fundamentals

FAB 102 1465

Duration and class size

The length of the course is 3 days and the maximum number of participants is 8.

Learning situation

This course is based on instructor-led theoretical lessons and practical exercises in a classroom environment.

Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Short description of the topics in the course	Estimated time
1	• Course Introduction	1,0 h
	• Pre Test	1,0 h
	• Traffic Theory	2,0 h
	• STS Functionality	2,0 h
2	• GSM Advanced Radio Statistics	6,0 h
3	• GSM Advanced Radio Statistics (continued)	1,0 h
	• Statistics Recording Tools	4,0 h
	• Pos Test	1,0 h

Using the FMX Tool



LZU 108 5148 R2A

Description

Do you want to become a Fault Management Expert? Then this is the course for you. The usage of the FMX tool as well as the development and maintenance of the expert system for intelligent alarm handling is covered in detail. The main focus will be on how to create, develop and administrate FMX modules and rules. The student will gain knowledge about the purpose of FMX regarding the contents, functionality and the connection to other applications in the management system.

In a safe training environment the students are guided through structured exercises, where mistakes are turned into a learning situation instead of network problems. The course can also be delivered On-Site.

Learning objectives

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

1 Detail the purpose of FMX

- 1.1 Explain where FMX is used and what are the advantage of FMX
- 1.2 Detail the general flow of an alarm record when FMX is used
- 1.3 Detail the concepts of module, event discriminator and rule

2 Use the FMX user interfaces to:

- 2.1 Create and maintain FMX modules
- 2.2 Create rules in the FMX Rule editor
- 2.3 Test FMX modules and their contents
- 2.4 Work according to a workflow

3 Use the FMX for rule design:

- 3.1 Configure the different building blocks in the Rule Editor
- 3.2 Design and create own FMX alarms
- 3.3 Detail the concept of objects and attributes used in FMX

4 Use advanced features in FMX to:

- 4.1 Administrate the FMX application
- 4.2 Execute actions and retrieve results between FMX and a network element
- 4.3 Interact with the UNIX environment

Target audience

The target audience for this course is : System Engineers, System Administrators

Prerequisites

The student should have completed the following courses:

WCDMA Fundamentals FAB 102 1316 or 1317

GSM or WCDMA Network Surveillance
LZU 108 5150

Or

OSS On-site Introduction Workshop
LZU 108 6164

The course can also be delivered as part of the FMX Starter Package service (see 3/221 03-FAP 130 509), in which case the course is 3½ days

Duration and class size

The length of the course is 4 days and the maximum number of participants is 8.

Learning situation

This course is based on theoretical and practical instructor-led lessons given in both classroom and in a technical environment using equipment and tools.



Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Short description of the topics in the course	Estimated time
1	<ul style="list-style-type: none">• What is FMX?	1 h
	<ul style="list-style-type: none">• Working with FMX	3 h
	<ul style="list-style-type: none">• Tools for Rule Design	2 h
2	<ul style="list-style-type: none">• Tools for Rule Design	6 h
3	<ul style="list-style-type: none">• Tools for Rule Design	6 h
4	<ul style="list-style-type: none">• Features and Rule Implementation	6 h

Automated O&M using Operations Procedure Support



LZU 108 5149 R2A

Description

This course makes familiar with the Operations Procedure Support (OPS) scripting language necessary for Remote Function Change and Automatic Correction Deployment of an AXE. It introduces scripted solutions and works with the OPS Graphical User Interface.

Learning objectives

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

- 1 **Work with the OPS Graphical User Interface**
- 2 **Explain the structure of the OPS script language including the structure of subroutines**
- 3 **Understand and write OPS scripts**
- 4 **Find and react on script errors**

Target audience

The target audience for this course are Ericsson employees and Ericsson customers working in the technical operation area of the GSM/WCDMA network represented by network engineers..

Prerequisites

The participants should be familiar with AXE 10 (MML commands, ALEX) and UNIX.

Duration and class size

The length of the course is 2 days and the maximum number of participants is 8.



Learning situation

The course is based on instructor-led lessons, demonstrations and hands-on exercises. The exercises are mainly case oriented where the participants are expected to investigate applications and find their own solutions rather than following step by step instructions.

The course could be conducted at an Ericsson training center or at a customer site. For security reasons only printout commands are sent to the network elements at a customer site. It's recommended that the exercises are reviewed by the customer before course conduction. For hands-on exercises, one computer is needed for every two participants.

Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Short description of the topics in the course	Estimated time
1	OPS GUI / NUI	1,0h
	OPS Scripting	2,0h
	Exercises:	3,0h
	- OPS GUI	
2	- OPS Script Language Basics	
	- OPS Script Language	
	OPS Subroutines	1,0h
	Exercises:	5,0h
	- OPS Script Language	
	- OPS Tasks	

GSM/WCDMA Core Network Overview



LZU 108 5201 R2A

Description

This course provides students with an overview of the GSM/WCDMA Core Network, with all its components, functions and characteristics.

Learning objectives

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

- 1 **State the main functions of the GSM/Wideband Code Division Multiple Access (WCDMA) Core Network**
 - 2 **Explain the difference between a second generation (2G) Core Network and a third generation (3G) Core Network**
 - 3 **Explain the migration path from a 2G Core Network to a 3G Core Network**
 - 4 **State the main functions of the nodes which comprise the WCDMA Core Network**
- Detailed Learning Objective

Target audience

The target audience for this course is: Service Planning Engineers, Service Design Engineers, Network Design Engineers, Network Deployment Engineers, Service Deployment Engineers, System Technicians, Service Technicians, System Engineers, Service Engineers, Field Technicians, System Administrators, Application Developers, Business Developers, Customer Care Administrators.

Prerequisites

The participants should be familiar with telecommunication basics.

Duration and class size

The length of the course is 3 hours.

Learning situation

Web-based learning

GSM BSC Maintenance



LZU 108 5458/4 R2A

Description

The learning product enables the students to perform hardware maintenance on the BSC. The course will provide radio network technicians and radio network engineers with basic abilities to act on hardware faults, do hardware replacement, and follow maintenance routines using the system documentation and local Operation and Maintenance (O&M) tools.

The course is modular, being built up of cases, each case consisting of one or more related events. A sufficient pool of cases and events is provided so that maintenance of all supported GSM BSC hardware configurations may be trained.

Specifically, cases and events may be selected from the learning product to train configurations built up of the following hardware elements:

AXE Central Hardware Elements

APZ 212 20

APZ 212 25

APZ 212 30 and 33

IOG 20

APG 40

AXE Subordinate Hardware Elements

128K GS

RP, EM, RPG

BSC-specific elements (TRAU, SRS)

Learning objectives

On completion of this course the participants will be able to (after completing all events in the case / event pool for the learning product):

- 1 Generate printouts according to a Work Order, using local Operation and Maintenance (O&M) tools and on-line system documentation**
 - 1.1 Log and save printouts, using local O&M tools
- 2 Locate and identify GSM hardware units, using online documentation**
 - 2.1 Determine the order number and release revision of hardware elements, using the Alex library
 - 2.2 Generate printouts per the Work Order, using local O&M tools and online documentation
 - 2.3 Exchange subordinate hardware elements, using online documentation
- 3 Perform repair sequences on GDM hardware elements (RPs, EMs), using WinFIOL / OSS-RC, online documentation, and data from a Work Order**
- 4 Determine the order and release revision of AXE central elements, using online documentation**
 - 4.1 Exchange hardware units in AXE central elements, using online documentation
 - 4.2 Perform repair sequences on AXE central hardware elements, using WinFIOL/ OSS-RC, online documentation, and data from a Work Order
 - 4.3 Generate status printouts of AXE central elements per a Work Order, using local O&M tools and online documentation
 - 4.4 Determine APZ system status, using visible hardware indicators
- 5 Locate and identify IOG 20 / APG 40 hardware units, using online documentation**
 - 5.1 Generate printouts of IOG 20 / APG 40 system status and hardware elements, using local O&M tools and online documentation
 - 5.2 Perform repair sequences on IOG 20 / AOG 40 hardware elements, using WinFIOL/ OSS-RC, online documentation, and data from a Work Order
- 6 Save a system backup copy on removable media, using online documentation and Work Order data**
 - 6.1 Generate printouts according to a Work Order, using local O&M tools and online documentation
 - 6.2 Transfer a file from removable media to hard disk, using online documentation and Work Order data
- 7 Test load a system backup copy, using online documentation and Work Order data**
- 8 Perform routine preventive maintenance on the AXE, using online documentation**
- 9 Perform repair sequences on BSC-specific hardware elements (TRAU, SRS), using WinFIOL/OSS-RC, online documentation, and data from a Work Order**

Target audience

The target audience for this course is: System Engineers, Service Engineers, Field Technicians

Prerequisites

Successful completion of the following courses:

GSM Network Fundamentals

FAB 102 1465

Duration and class size

The length of the course is 7 days and the maximum number of participants is 8.

Depending on the customer scenario the modules can be left out and the duration can be shortened to 5 days.

The duration of an AXE 810 only delivery is 5 days.

Learning situation

This course is based on theoretical and practical instructor-led lessons given in both classroom and in a technical environment using equipment and tools. Working in groups of two for most events, students are issued various Work Orders to resolve hardware faults, perform hardware replacement, and follow simple non-fault related maintenance routines using the system documentation. The instructor acts as facilitator, helping students to obtain the required competency

Wherever possible, the group size will be limited to two students, though larger groups may be required from time to time.

The instructor in general acts as guide or facilitator, allowing the students to proceed independently, assisting only where necessary to ensure that the students obtain the necessary competence. Infrequently, the instructor will also present instructional material, either to preface an event or in summation. Instances of pure lecture, however, are limited.

GSM Network Surveillance



LZU 108 5471/2 R3A

Description

When you finish this course, your network surveillance skills will include basic alarm supervision, handling and escalating core and radio network specific alarms, trigger node backups, and supervise statistics recordings. When you receive a work-order, you will be able to execute a script on a node using Job Manager and Operation Procedure Support.

Learning objectives

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

- 1 **Utilize the system documentation efficiently for network surveillance tasks as defined in Ericsson's Customer Product Information (CPI).**
- 2 **Perform basic alarm supervision in order to maintain the network as defined in CPI.**
- 3 **Handle the most common alarm situations in a GSM Network to maintain the network.**
- 4 **Explain how to launch and use OSS-RC applications in order to perform network surveillance activities.**
- 5 **Explain the different applications in the sub-network management system, OSS-RC, that are used for Network Surveillance.**
- 6 **Handle core network specific alarms with OSS-RC for MSC, M-MGw, SGSN and GGSN according to the CPI documents.**
- 7 **Handle the Radio Network specific alarms with OSS-RC.**
- 8 **Initiate a system back up on node level.**
- 9 **On receipt of a work-order, retrieve statistics by using the correct applications in OSS-RC.**
- 10 **On receiving a work-order execute a script on a node using Job Manager and OPS.**

Target audience

The target audience for this course is: System Technicians.

Prerequisites

Successful completion of the following courses:

- GSM Network Fundamentals, Blended Training

FAB 102 1465



Duration and class size

The length of the course is 3 days and the maximum number of participants is 8.

Learning situation

This is a task-oriented learning course based on tasks in the work process given in a technical environment using equipment and tools.

Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Topics in the course	Estimated time
1	• Introduction	2 hours
	• Network Management	4 hours
2	• Fault Management in Core Network	3 hours
	• Fault Management in GERAN	3 hours
3	• Performance Management in Core Network	3 hours
	• Performance Management in GERAN Network	3 hours

RBS 2X06/2X07/2112 Maintenance



LZU 108 5741 R4A

Description

If you need to perform hardware fault localization and replacement in RBS 2106/2206, RBS 2107/2207 and RBS 2112 family, then this course is for you. The main focus of this task-based course is maintenance procedures including the usage of the necessary documentation to handle each process.

Learning objectives

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

- 1 Recognize and identify GSM Basic System and components using student material and instructor explanation.**
 - 1.1 Identify the GSM/BSS network
 - 1.2 Name the BSS interfaces
 - 1.3 Explain the LAPD configurations
 - 1.4 State the Cascade and TG Sync configurations
- 2 Discriminate the functionalities, capabilities and structure of each part of the RBS 2X06, 2X07 and 2112, exploring student book and available RBS hardware.**
 - 2.1 Identify the different RBS cabinets and the main characteristics
 - 2.2 List the functions of the RBS 2X06, RBS 2X07 and RBS 2112 sub-racks
 - 2.3 Recognize boards and modules, including connections, indicators (LEDs) and buttons.
 - 2.4 Identify the optional RUs
 - 2.5 Detail the Climate System and Power System of each RBS
- 3 Review the radio site installation, connections and external Battery Backups, using the information with the Installation Manual and Product Description for each RBS.**
 - 3.1 Briefly explain the radio site installation
 - 3.2 List some BBS 2000i, and PBC 6500 for indoor RBSs
 - 3.3 Identify the BBU 9500 for outdoor RBSs
 - 3.4 List some technical structural information of RBS
 - 3.5 Recognize the Power System of each RBS
 - 3.6 Review information about the Connection Field, Antenna Connection and EPC Bus
 - 3.7 Analyze the BBS 2000, data of the RBSs.
- 4 Configure or reconfigure a RBS2000 series for RF connections, activate the TG Sync feature, use some optional equipments, and execute basic connections in the DXU, CDU, CXU, ASU and HCU using user guide and appropriate procedure**
 - 4.1 List basic RBS antenna configurations for different CDUs
 - 4.2 Determine when and how to implement ASU and HCU
 - 4.3 Identify the Dual Band Configuration in the RBS 2X06
 - 4.4 Implement TG-Sync configuration
- 5 Measure Distance To Fault (DTF) and Standing Wave Ratio (SWR), used to verify the antenna system installation and also feeder measure, based on instructions in the Installation Manual of each RBS operating Anritsu Site Master.**
 - 5.1 Configure the ANRITSU Site Master properly

- 5.2 Understand and perform the DTF Test
- 5.3 Understand and perform the SWR test and its importance
- 5.4 Perform preventive maintenance on the antenna system
- 6 Operate RBS 2000 series, using the a graphical software OMT following instructions to perform the mains functions of this software in “off line” and “online” state.**
 - 6.1 Identify and navigate on the OMT application
 - 6.2 Configure and install correct Installation Data Base, IDB, using the OMT
 - 6.3 Use the functions available in the OMT
 - 6.4 Perform VSWR, temperature, voltage and current measurements.
- 7 Examine the maintenance process and perform the correct maintenance procedures based in the Maintenance Manual.**
 - 7.1 Perform fault localization on RBS equipment with effective results
 - 7.2 Perform simple repair procedures and replace faulty hardware units successfully
 - 7.3 Monitor the fault status of the RBS using the OMT
 - 7.4 Work according to the RBS maintenance process
 - 7.5 Perform preventive maintenance on the RBS
 - 7.6 Monitor internal and external alarms using the OMT
 - 7.7 Fill in a Repair Delivery Note, Blue Tag, and a trouble report
 - 7.8 Handle replaced units in a proper manner

Target audience

The target audience for this course is: Field Technicians.

Prerequisites

Successful completion of the following flow:

GSM Network FundamentalsFAB 102 1465

Duration and class size

The length of the course is 3 days and the maximum number of participants is 8.

Learning situation

The course is based on instructor-led lessons and practical exercises (case based learning).



Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Topics in the course	Estimated time
1	Course Introduction	0,5 h
	RBS 2000 Library	0,5 h
	GSM/BSS Overview	1,0 h
	RBS Functional Overview	3,0 h
	• Case 1 – System Overview	0,5 h
	• Case 2 – DXU-21	0,3 h
	• Case 3 - CXU	0,2 h
2	Site Equipment Technical Data	1,0 h
	RBS Configurations	2,5 h
	• Case 4 - Configuration with CDU-G, CDU-F, CDU-J and TG synchronization	0,5 h
	Antenna System Test	0,2 h
	• Case 5 – Antenna Test	0,8 h
	OMT Introduction	1,0 h
3	• OMT Exercises	1,0 h
	• Case 6 – Using OMT	1,0 h
	Maintenance Procedures	0,5 h
	• Case 7 – dTRU	0,5 h
	• Case 8 – Climate Test	0,5 h
	• Case 9 – Maintenance Case	2,0 h
	• Case 10 – Preventive Maintenance	0,5 h

GPRS/EDGE Signaling



LZU 108 5931 R3A

Description

This course handles the protocols and the signaling in the GPRS, EDGE System. It also handles mapping and allocation of the GPRS channels and the main features of the air interface. The course includes traffic cases handling both the core network and the air interface.

The course together with the practical part (i.e. exercises) is a complement of the “GPRS system survey” and will extend the areas Detailed in this survey.

Learning objectives

On completion of this course the participants will be able to: Detail the architecture of the GPRS Network

1 Detail the GPRS services

1.1 List and Detail the function of the units of GPRS system

2 Explain the signaling between the nodes and the protocols.

2.1 List the different GPRS interfaces

2.2 List the protocols used in the GPRS interfaces

2.3 Briefly Detail the payload handling in the different GSN nodes

3 Understand the GPRS logical channels and the messages sent on these channels

3.1 List the messages sent on the logical channels

3.2 Detail the structure of the logical channels

3.3 Detail the mapping of logical channels

3.4 Detail the channel allocation

4 Understand the architecture and identities of the Gb interface and GB over IP

4.1 Detail the BSS architecture, with A-bis interface

4.2 Detail the BSSGP, NS, Link Layer and Physical Layer protocols

4.3 Detail the BSSGP over IP

5 List the different types of interface in the core network

5.1 Detail the SS7 and IP interfaces

5.2 Detail the GPRS tunneling protocol

6 Understand, Detail and explain how different traffic cases are handled by the system.

6.1 Detail the GPRS attach, the PDP context activation and different update procedures

6.2 Detail signaling during these different traffic cases

6.3 List nodes involved in traffic cases

Target audience

The target audience for this course is: Network Design Engineers, Network Deployment Engineers, System Technicians, System Engineers, Field Technicians.

This audience is technical personnel in need of a global understanding of GPRS Network.

Prerequisites

Successful completion of the following flow:

GSM Network Fundamentals, FAB 102 1465

Duration and class size

The length of the course is 3 days and the maximum number of participants is 16.

Learning situation

This course is based on theoretical instructor-led lessons given in a classroom environment.

Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Topics in the course	Estimated time
1	• Introduction of GPRS nodes and interfaces	3 hours
	• Um Interface	3 hours
2	• Logical channels	4 hours
	• Channel Administration	2 hours
3	• Gb Interface and GB over IP	2 hours
	• Core interface	2 hours
	• Traffic cases	2 hours

GSM OSS Radio Network Optimizers



LZU 108 5963 R3A

Description

Do you know how to use OSS for RAN optimization? If you want to improve your optimization tasks using OSS tools appropriately, this course is for you. It will deal with the GSM OSS Radio Network Optimization tools for surveillance, optimization and troubleshooting of the GSM radio network. It will focus on how to use the tools for setting up new measurements and how to generate and customize reports..

Learning objectives

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

- 1 Handle common RNO functions configuring tool parameters and interfaces and obtain reports.**
 - 1.1 Explain how to change the RNO System Parameters
 - 1.2 Create Cell/Frequency Sets
 - 1.3 Handle RNDBI (RNO Database Export Interface)
 - 1.4 Explain how Business Objects can be used to generate reports

- 2 Use MRR – Measurement Result Recording to generate reports and analyze signal quality and identify troubles.**
 - 2.1 Handle MRR reports
 - 2.2 Use MRR for signal quality surveillance
 - 2.3 Use MRR for trouble shooting

- 3 Run NCS/NOX – Neighboring Cell Support/Neighboring Cell List Optimization Expert to locate and study neighbor relation**
 - 3.1 Use NCS to find new possible neighbors
 - 3.2 Use NCS to identify poor neighbor relations
 - 3.3 Handle NOX change order recommendation
 - 3.4 Explain how the NOX algorithm remove/add neighbors
 - 3.5 Handle the Barring Matrix

- 4 Use FAS/FOX – Frequency Allocation Support/Frequency Optimization Expert to record uplink and downlink interference and estimation**
 - 4.1 Use FAS for recording of uplink Interference
 - 4.2 Use FAS for estimation of downlink interference
 - 4.3 Use FOX in recommendation or automatic mode
 - 4.4 Explain how the FOX algorithm finds frequency reallocations

- 5 Configure and use SYROX – Synchronized Radio Network Optimization Expert generating reports**
 - 5.1 Explain Fractional Load Planning
 - 5.2 Use SYROX to find values for HSN, MAIO, TSC and FNOFFSET in a synchronized cluster
- 6 Use TET – Traffic Estimation Tool**
 - 6.1 Interpret Traffic level and off load reports

Target audience

The target audience for this course is: Service Planning Engineers, Service Design Engineers, Network Design Engineers.

Prerequisites

Successful completion of the following courses:

Cell Planning Principles	LZU 108 3273
GSM Radio Network Features	LZU 108 3704
GSM Radio Network Tuning	LZU 108 3298

Duration and class size

The length of the course is 2 days and the maximum number of participants is 8.

Learning situation

This course is based on theoretical and practical instructor-led lessons given in both classroom and in a technical environment using equipment and tools.



Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Topics in the course	Estimated time
1	RNO common functions	1,0 h
	MRR Measurement Result Recording	3,0 h
	NCS – Neighboring Cell Support	2,0 h
2	NOX – Neighboring Cell List Optimization Expert	1,0 h
	FAS – Frequency Allocation Support	2,0 h
	FOX – Frequency Optimization Expert	1,5 h
	SYROX – Synchronized Radio Network Optimization Expert	1 hour
	TET – Traffic Estimation Tool	0,5 hour

GSM RBS 2308/2309/2109 Implementation & Maintenance



LZU 108 6106 R2A

Description

If you need to perform hardware fault localization and replacement in RBS 2308/RBS 2309 and RBS 2109, then this course is for you. The main focus of this task-based course is the implementation and maintenance procedures including the usage of the necessary documentation to handle each process.

Learning objectives

On completion of this course the participants will be able to

- 1 Identify the equipment, the function of each unit and the possible configurations using student material and instructor explanation.**
 - 1.1 Identify the Ericsson GSM network system model and BSS system architecture, including the interfaces and understand the GSM Micro RBS concept
 - 1.2 List the RBS 2308/2309/2109 Basic Product information
 - 1.3 Recognize the RBS 2308/2309/2109 units theory (MCB, IXU, RRU and MCB)

- 2 Recognize the installation and integration process, configure, reconfigure, maintain and operate the RBS 2308/2309/2109 using the graphical Software OMT.**
 - 2.1 Understand the Installation and the Configuration Theory
 - 2.2 Identify RBS space requirements
 - 2.3 List RBS interfaces – Transmission and External Alarms
 - 2.4 Perform the OMT Configurations, Maintenance and Exercises
 - 2.5 Understand the Basic Integration process
 - 2.6 Use the fault monitor and test in RBS 2308/2309/2109
 - 2.7 Perform the RBS 2308/2309/2109 Maintenance using the RBS Manuals



Target audience

The target audience for this course is: Field Technicians.

Prerequisites

Successful completion of the following courses:

- GSM Fundamentals FAB 102 1465
- GSM RBS 2X06/2X07/2112 Maintenance LZU 108 5741

Duration and class size

The length of the course is 2 days and the maximum number of participants is 8.

Learning situation

The course is based on instructor-led lessons and practical exercises (case based learning).

Time Schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as an estimate.

Day	Topics in the course	Estimated time
1	• Introduction	0,1 h
	• GSM RBS 2308/2309/2109 Maintenance Pre - Test	0,1 h
	• GSM Micro RBS Concept	0,1 h
	• RBS 2308/2309/2109 Basic product information	0,7 h
	• RBS 2308/2309/2109 units theory	2 h
	• Optional Products – RBS 2308/2309/2109	1 h
	• Configurations	0,5
	• Cabinet Interconnections	1,5 h
2	• Review day 1	0,5 h
	• Installation/configuration theory	1 h
	• OMT – Configurations, Maintenance and Exercises	1 h
	• Basic RBS Integration Concepts	0,5 h
	• Testing RBS	0,5 h
	• RBS Maintenance	1,7 h
	• GSM RBS 2308/2309/2109 Maintenance Post – test	0,5 h
	• Course Conclusion and Evaluation	0,3 h

Remote SW Handling using SMO



LZU 108 6107 R1A

Description

This course deals with the Software Management Organizer (SMO). SMO is a common application for remote software handling activities towards different types of network elements. This course handles software for AXE-10 based nodes and GSM RBSs.

With the graphical user interface of SMO, you can supervise parallel activation jobs towards multiple network elements from a single terminal.

SMO provides the following functions for the operator:

- Software inventory, including compare between network elements
- Software distribution from OSS to network elements
- Remote software upgrade
- Monitor upgrade jobs towards multiple network elements in parallel
- Backup administration, including transfer of backups to OSS
- Uniform handling of different network element types

The course also deals with Operations Procedure Support (OPS) development and run-time control of MML command files. In this way the application provides support for automation and control of the network operator's processes.

- In OPS the following functions are available:
- Operation Procedure Support GUI
- OPS Script Language
- OPS Script Progress monitoring

Learning objectives

On completion of this workshop the participants will be able to:

1 Use SMO graphical user interface

- 1.1 Import and unpack software packages into SMO file store
- 1.2 Retrieve information about software installed in different Network Elements
- 1.3 Execute and monitor update jobs
- 1.4 Handle backup administration

2 Handle OPS scripts

- 2.1 Explain the structure of the OPS script language including the structure of subroutines
- 2.2 Understand and write OPS scripts
- 2.3 Find and react on script errors

3 Understand the update procedure of an AXE10

- 3.1 Explain and prepare the necessary steps to update an AXE 10 in GSM R9.1
- 3.2 Explain and perform the update

4 Handle GSM RBS software

- 4.1 Download and activate GSM RBS software

Target audience

The target audience for this course is internal personnel and also customers working in the technical operation area of the GSM network represented by network engineers.

Prerequisites

The participants should be familiar with RBS Software configuration, AXE 10 SW and with the procedure of an AC-A packet implementation.

Duration and class size

The length of the course is three days and the maximum number of participants is eight.

Learning situation

The course is based on instructor-led lessons, demonstrations and hands-on exercises. The exercises are mainly case oriented where the participant is expected to investigate applications and find their own solutions rather than following step-by-step instructions.

The course should be conducted at an Ericsson training center. For hands-on exercises, one computer is needed for every two participants.



Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Short description of the topics in the course	Estimated time
1	Introduction to SMO	3 h
	Adjust, Handling files with SMO	3 h
2	Introduction to OPS	1,5h
	Subroutines	0,5h
	DESPERADO	0,5h
	Practical Exercise: OPS Scripting	3,5h
3	Introduction to Updates	1,0h
	Preparation of Update	1,0h
	Practical Exercise: Update	3,0h
	GSM RBS Download and activation of software	1,0h

GSM/WCDMA Transport Network Overview (WBL)



LZU 108 6114 R1A

Description

This course provides a general introduction to the WCDMA Transport Network and explains on overview level the Transport Network components and underlying Transport Network technologies.

The features and functionality of the Transport Network elements are explored along with a description of Ericsson Transport Network products.

Learning objectives

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

- 1 **State the main functions of the Transport Network**
- 2 **Explain the purpose and usage main Transport Network protocols SDH, ATM and IP**
- 3 **Outline the implementation of the Transport Network in the WCDMA Core Network**
- 4 **List the Ericsson Transport Network ATM and IP products and outline their capabilities**

Target audience

The target audience for this course is: Service Planning Engineers, Service Design Engineers, Network Design Engineers, Network Deployment Engineers, Service Deployment Engineers, System Technicians, Service Technicians, System Engineers, Service Engineers

Prerequisites

Successful completion of the course:

WCDMA Core Network Overview (WBL)
LZU 108 5201

Duration and class size

The length of the course is 3 hours.

Learning situation

Web-based learning

GSM/WCDMA Traffic Cases (WBL)



LZU 108 6115 R1A

Description

This course is a web-based course and explains on overview level data and speech traffic cases. It illustrates with signaling diagrams the call setup and mobility management procedures.

The web-based course presentation visualizes animated message flows and an information area where the explanatory text is shown. Different levels of details are presented.

After the course the improved knowledge of the student can be tested in a question and answer session.

The participant will explore each traffic case and follow on the screen the respective signaling flow. In the introduction to each case the concepts and terms are explained and the flow is visualized in detail.

The information window and the pop-up windows will provide additional information about the current message and explanation of what happens in the receiving party when the message is received.

Learning objectives

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

1 List and explain the signaling interfaces involved and the respective message flow on overview level for the following traffic cases:

- 1.1 GSM MS Originated Speech Call
- 1.2 GSM MS Terminated Speech Call
- 1.3 GSM Intra and Inter MSC handover
- 1.4 GSM IMSI Attach
- 1.5 GSM IMSI Detach
- 1.6 GSM Location Update
- 1.7 GSM GPRS Attach
- 1.8 GSM GPRS Detach
- 1.9 GSM PDP Context Activation
- 1.10 GSM PDP Context Deactivation
- 1.11 GSM GPRS Location Update Procedures

2 List and explain the signaling interfaces involved and the respective message flow on overview level for the following traffic cases:

- 2.1 WCDMA Mobile Originated speech call
- 2.2 WCDMA Mobile Terminated speech call
- 2.3 WCDMA Mobile to Mobile speech call
- 2.4 WCDMA GPRS attach
- 2.5 WCDMA GPRS detach
- 2.6 RAB Re-establishment
- 2.7 Network Initiated RAB re-establishment
- 2.8 WCDMA PDP Context Activation

- 2.9 WCDMA PDP Context Deactivation
- 2.10 WCDMA MS originated/terminated Payload Traffic
- 2.11 WCDMA Intra and Inter SGSN Routing Area Update
- 3 Explain the signaling and payload paths in horizontal network architecture.**
- 4 Search and find information in the WBL about the main nodes involved in the traffic case.**

Target audience

The target audience for this course is: Service Planning Engineers, Service Design Engineers, Network Design Engineers, Network Deployment Engineers, Service Deployment Engineers, System Engineers, Service Engineers, System Administrators

Prerequisites

Successful completion of the following courses:

GSM/WCDMA Core Network Overview
LZU 108 5201

OSS-RC Overview
LZU 108 6231

GSM Radio Network Overview
LZU 108 6235

Duration and class size

The length of the course is 4 hours.

Learning situation

Web-based learning

OSS RC On-Site Introduction Workshop



LZU 108 6164 R2A

Description

Do you find network management a high-pressure and challenging activity? On a daily basis must you respond to demands for the status of the network, network trends and optimization? This OSS RC On-Site Introduction Workshop will give the customer an introduction to the various applications available in OSS RC for management of the Ericsson network.

The course focuses on a pro-active approach to network management and will introduce the OSS RC applications that are used for the following key aspects of network management.

Finding the current status of the network and troubleshooting the network in the event of errors.

Identifying trends in the network, predicting problems and optimising the network as a result.

Regular maintenance tasks to keep the mobile network running smoothly at all times.

After the course, the participants should have a basic understanding of how to use the OSS RC applications and proceed using the application themselves or continue with the advanced training courses.

The contents of this course can be customized based on applications installed and customer's demands and focus. For example it can be customized to focus on GSM customers or WCDMA customers.

Learning objectives

The participants of the course will be able to choose from the following modules with the following objectives:

OSS RC Introduction LZM 112 406

- 1 Explain why network management is necessary, and outline the role of OSS-RC as a network management system**
 - 1.1 Briefly describe the overall functionality offered by OSS RC R3, according to system documentation
 - 1.2 List the OSS RC common components, core network components, WCDMA RAN components and GSM RAN components
 - 1.3 Briefly describe the structure of the Active Library Explorer, ALEX for OSS RC R3.
 - 1.4 Briefly describe functionality offered by the common integration framework, CIF according to CPI for OSS RC R3
 - 1.5 Compare the cluster and replications solutions available for high availability in OSS RC R3

OSS RC Fault Management LQM 112 407

- 2 Explain the purpose of Fault Management (FM) in OSS RC, outline its benefits and discuss the architecture of the FM System according to OSS RC R3 system documentation**
- 2.1 Explore the various FM applications available in OSS RC R3 for operators working in a Network Management Centre
- 2.2 Describe the Alarm Handling process in OSS RC R3

OSS RC Software/Hardware Management LQM 112 408

- 3 Explain the importance of Software Management Organizer (SMO) in OSS RC R3 for regular maintenance of AXE, CPP, WPP and J20 network elements.**
- 3.1 Describe the SMO Architecture and Network Inventory Organizer (NIO) Architecture according to Alex documentation
- 3.2 Examine and test the functionality offered by SMO and NIO in OSS RC R3

OSS RC Performance Management LQM 112 409

- 4 Explain the Performance Management solution, Network Statistics (NWS) available in OSS RC R3 to identify trends in the network**
- 4.1 Examine the SMIA, MIA, PDM and PMS tools that are used for Data Initiation in different network Elements supported by OSS RC R3
- 4.2 Describe the data mediation tools (SGW) and storage methods (SDM) used in NWS System.
- 4.3 Describe the functionality available from Performance Statistical Alarm (PSA) Application to monitor thresholds in NWS
- 4.4 List the Ericsson pre-defined reports available in NWS and examine a report in Business Objects.

OSS RC Scripting LQM 112 410

- 5 Explain the functionality of the Job Manager in OSS RC R3, according to the Customer Product Information.**
- 5.1 Discuss the Job Structure and differentiate between the various components of a job such as tasks and activities, as described in Alex
- 5.2 Explore the options available from the Job Editor, Task Editor and Job Supervisor GUIs

OSS RC AXE Handling LZM 112 411

- 6 Outline the AXE communication process and briefly outline the MML command structure available to network elements built on AXE platform**
- 6.1 Explain the CHA and WinFIOL tools available in OSS RC R3 for MML communication towards AXE network elements
 - 6.2 Explore the functionality available from the AXE Element Management Tools; Command Log Search, Spontaneous Reports Manager and Element Manager Activity Manager
 - 6.3 Describe the Operations Support Procedure (OPS) Tool in OSS RC R3, and explore the OPS Scripting language for script development towards AXE network elements

OSS RC MSC/MGW Configuration Management LZM 112 412

- 7 Describe the key functions of the MSC and MGW in the Core Network, and identify the properties that can be easily configured from MSC-MGW Configuration Manager (MMCM) in OSS RC R3**
- 7.1 Explore the process to perform a configuration job on an MSC/MGW using MMCM, and examine the consistency check and audit features of MMCM.

OSS RC GPRS Management LZM 112 413

- 8 Identify the key functions of the SGSN and GGSN in the Packet Switched Core Network, and outline the GPRS Configuration Management and GPRS Monitoring features in OSS RC R3**
- 8.1 Examine the GPRS Configuration Management (GCM) Application to identify the properties that can be configured from the GUI and discuss the configuration process in the GCM tool
 - 8.2 Describe the GPRS Testing and Monitoring feature and its application in the GPRS network for testing/tracing and monitoring the PS network

OSS RC WCDMA RAN Management LZM 112 414

- 9 Briefly describe the WCDMA RAN network elements and their responsibility in the UMTS network, according to system release WCDMA RAN P4.0**
- 9.1 Describe the functionality of the WCDMA RAN Explorer in OSS RC R3, according to CPI documentation
 - 9.2 Be familiar with the remote configuration process in the WCDMA RAN, and understand the difference between a valid and planned area
 - 9.3 Examine the various Diagnostic and Configuration applications in the WCDMA RAN Explorer and discuss their application in the UMTS network
 - 9.4 Differentiate between the WCDMA Monitoring, GPEH, UETR and CTR and be able to describe the Recordings and Events Interface

OSS RC GSM RAN Management LZM 112 415

10 Briefly describe the GSM RAN network elements and their responsibility in the GSM network, according to system release GSM RAN R12

- 10.1 Describe the OSS RC R3 Applications available to operators for GSM RAN configuration, performance management and optimization
- 10.2 Be familiar with CNA and the concepts of valid and planned are network configurations
- 10.3 Explore the Base Station Management (BSM) feature and be familiar with the OSS RC R3 tools for 2G RBS configuration
- 10.4 Describe the use of the PMR applications (MTR, CTR and CER)
- 10.5 Be able to describe the Radio Network Optimization tools available in OSS RC R3
- 10.6 Explain the concept behind R-PMO and where it can be applied in the GSM RAN

Target audience

The target audience for this course is: Network Design Engineers, Network Deployment Engineers, Service Deployment Engineers, System Engineers, Service Engineers, Field Technicians and System Administrators.

This audience is any personnel working with OSS RC, requiring an introduction in how to use OSS RC for network management purposes, within their respective work area.

Prerequisites

The participants should be familiar with GSM network or WCDMA network.

Duration and class size

The length of the course is 5 days and the maximum number of participants is 8. However it can be customized according to customer needs.

Learning situation

This is a workshop based on interactive training sessions in a classroom environment. The contents are based on the modules chosen by the customer as well as the scope of the modules.



Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Modules in the course	Estimated time
1	<ul style="list-style-type: none">• OSS RC R3 Introduction• Fault Management	3 hours 3 hours
2	<ul style="list-style-type: none">• Hardware/Software Management• Performance Management	3 hours 3 hours
3	<ul style="list-style-type: none">• Scripting in OSS RC R3• AXE Handling in OSS RC R3• MSC-MGw Configuration Management• GPRS Management	1.5 hours 1.5 hours 1.5 hours 1.5 hours
4	<ul style="list-style-type: none">• WCDMA RAN Management	6 hours
5	<ul style="list-style-type: none">• GSM RAN Management	6 hours

OSS RC Overview (WBL)



LZU 108 6231 R1A

Description

Participants attending the OSS RC Introduction WBL course will be given a basic introduction to the Operation and Support System (OSS). The OSS is used for centralized Operation and Maintenance of mobile networks. OSS RC can manage Radio- (GSM) and Core Network (GSM and WCDMA) nodes.

Learning objectives

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

- 1 **Detail the purpose of OSS and its architecture**
- 2 **Detail the process of alarm handling.**
- 3 **List the different applications used in Fault Management**
- 4 **List the different application used for configuration of Radio and Core Network elements.**
- 5 **Detail the function of SMO.**
- 6 **Detail briefly how Network Elements (NE) can be displayed using GNIP and GCC.**
- 7 **Explain the difference between long-term and short-term statistics.**
- 8 **Detail how statistics are fetched from the NE, stored and displayed in OSS.**
- 9 **List the applications used for Radio Network Optimization.**

Target audience

The target audience for this course is: Service Planning Engineers, Service Design Engineers, Network Design Engineers, Network Deployment Engineers, Service Deployment Engineers, System Technicians, Service Technicians, System Engineers, Service Engineers, Field Technicians, System Administrators, Application Developers, Business Developers, Customer Care Administrators.

Prerequisites

Successful completion of the following courses:

GSM/WCDMA Core Network Overview

LZU 108 5201

Duration and class size

The length of the course is 3 hours.

Learning situation

Web-based learning

GSM Radio Network Overview (WBL)



LZU 108 6235 R1A

Description

Participants attending the GSM Radio Network Overview WBL course will be given a basic introduction to the Radio Access part of GSM.

Learning objectives

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

- 1 **Detail the Radio Network components, their functions, features and required specifications**
- 2 **Explain that the BSC controls the radio resources for the RBS**
- 3 **Outline the main working functions of a BSC, TRC and RBS**
- 4 **List the different versions of RBS's**
- 5 **Outline that an RBS contains a transmitter and a receiver and is the interface towards the MS**
- 6 **Explain the influence of EDGE to the Radio Network in terms of infrastructure requirements, Air Interface and end-user service enhancements.**
- 7 **Detail briefly the 3 different positioning methods available with Flexible Positioning Support CGI+TA, E-OTD and A-GPS positioning**

Target audience

The target audience for this course is: Service Planning Engineers, Service Design Engineers, Network Design Engineers, Network Deployment Engineers, Service Deployment Engineers, System Technicians, Service Technicians, System Engineers, Service Engineers, Field Technicians, System Administrators, Application Developers, Business Developers, Customer Care Administrators

Prerequisites

Successful completion of the following courses:

GSM/WCDMA Core Network Overview	LZU 108 5201
OSS-RC Overview	LZU 108 6231

Duration and class size

The length of the course is 3 hours.

Learning situation

Web-based learning

GSM BSC Operation



LZU 108 625 R7A

Description

How can you correctly operate your controller without knowing the correct procedures? In this course you will learn how to operate and configure the GSM BSS. The course covers configuration activities in the BSC/ TRC nodes and the interfaces to the core network nodes MSC and SGSN, the interface to the RBS and maintenance activities in the BSC. Participants will complete practical configuration and fault-finding exercises using on-line documentation and OSS-RC GSM RAN application or Winfiol.

Learning objectives

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

- 1 Identify the GSM/GPRS/EGPRS system using diagram in blocks of the identities and descriptive of all the units that compose the system.**
 - 1.1 List the Network Nodes of an Ericsson GSM System
- 2 Indicate the channels in the GSM/GPRS/EGPRS System explaining their purpose using pictures and table available in student material.**
 - 2.1 Explain the purpose of the logical channels used on the Air Interface for GSM and GPRS network.
 - 2.2 Discuss the EGPRS Coding Schemes and the EGPRS interface to RBS equipment based on network topology and interface description and definition.
 - 2.3 Clarify the measurement procedure used by GSM terminal equipment
 - 2.4 Explain the purpose of System Information in GSM
- 3 Configure the BSS Subsystem using OSS RC or Winfiol providing to the student the knowledge of the BSC, TRC and BSC/TRC hardware as well as the interfaces to the MSC, SGSN and RBS, and RBS2000 configuration.**
 - 3.1 Configure the Hardware and Interfaces of the BSC using MML commands and parameters
 - 3.2 Configure RBS 2000 equipment in the BSC using MML commands and parameters
- 4 Configure the Radio Network and define Cell Data knowing the main parameters and procedure to execute them.**
 - 4.1 Explain the purpose of basic BSC Cell parameters and the effects they have on the GSM Radio Access Network
 - 4.2 Configure the basic radio network in the BSC using MML commands and parameters



- 5 Execute performance measurement and supervision features that are available in BSS using appropriate command and WinFioI**
 - 5.1 Define supervision and recording processes in the BSC

- 6 Operate and supervise the BSC using the pre-defined routines and supervision command and tools analysis of the OSS.**
 - 6.1 Handle practical fault-finding on BSC hardware using On-line documentation

- 7 Identify how to maintain BSC/TRC using the main maintenance procedures described in the documentation.**
 - 7.1 Recognize the RBS Alarm Information displayed in the BSC

- 8 Execute BTS maintenance based on node diagnosis of fault conditions using the on-line documentation and maintenance procedures.**

Target audience

The target audience for this course is: System Technicians, System Engineers, Service Engineers, Field Technicians.

Prerequisites

Successful completion of the following flow and course:

GSM Radio network Surveillance

FAB 102 1327

GSM AXE Operation

LZU 108 5024/2

Duration and class size

The length of the course is 5 days and the maximum number of participants is 8.

Learning situation

The course is based on instructor-led lessons with practical exercises. Practical exercises are conducted in a training exchange environment.



Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Topics in the course	Estimated time
1	• GSM/GPRS/EDGE Network Description	1,0 h
	• Channel Concept GSM/GPRS/EDGE	3,0 h
	• Measurement Procedure	1,0 h
	• System Information	1,0 h
2	• BSS Configuration theory	3,0 h
	• BSS Configuration Exercises	3,0 h
3	• Radio Network, theory	4,0 h
	• Radio Network Exercises	2,0 h
4	• Radio Network Exercises, cont.	2,0h
	• Performance Measurement & Supervision	1,0 h
	• BSS Operation (HW Maintenance)	1,0 h
	• BSS Operation Exercises	2,0 h
5	• BTS Maintenance	2,0 h
	- RBS 200 and 2000 Alarm Indications in the BSC	
	- Testing and fault-finding of RBS equipment in the BSC	
	• BTS Maintenance Exercises	3 h
	• Test	0,5 h
	• Course Summary and Evaluation	0,5 h

GSM OSS RC System Administration



LZU 108 6440/2 R2A

Description

This course will give the student thorough knowledge about administration of the OSS RC system. After the course the students will be able to handle network element connections to GSM network elements, administration of the GSM related applications and both standard and corrective maintenance of the system. The student will gain knowledge about how to manage processes, errors and authority issues in the OSS system.

The course consists of chapters with both theoretical and practical sessions. The theoretical parts explain the structure of the OSS system and the network environment. In the practical sessions the students will be presented with the tasks required to administer and maintain an OSS system. The students solve the tasks on a training system, using the on-line documentation.

It should be noted that this is not an OSS operations course where the applications are operated, and neither does it give any information on how to operate or administer different network elements.

Learning objectives

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

1 Explain OSS on overview level

- 1.1 Explain the role that OSS plays in supporting a telecommunications network
- 1.2 Locate key documents in the ALEX documentation for OSS

2 Manage User accounts in OSS

- 2.1 Add and Delete OSS User Accounts
- 2.2 Modify a User's Authority in TSS
- 2.3 Use TSS Authority Administration GUI
- 2.4 Use TSS Password Administration CLI

3 Manage Processes in OSS

- 3.1 Explain the structure of Common Integration Framework and the services it provides
- 3.2 Explain the Managed Component (MC) Concept
- 3.3 Use the CIF Management Console to manage MCs
- 3.4 View CIF error log messages
- 3.5 Use CIF's command line interface
- 3.6 Use Object Explorer to access information hold in Configuration Services

4 Use the standard backup solution for backup and restore

- 4.1 Explain the overall file system layout
- 4.2 Explain the use of Diskgroups, Volumes and Plexes in Veritas
- 4.3 List and describe the functions of DMR
- 4.4 Use DMR to take File-System backups and restore
- 4.5 Use DMR for Mirror, Disk replacement and other tasks

5 Troubleshoot basic integration problems in OSS

- 5.1 Explain the OSS network environment
- 5.2 Explain the ONRM, it's topology and connection to other OSS Subsystems

- 5.3 Explain the ARNE tool and how data is managed within the ONRM
- 5.4 Explain the ONE Application's purpose
- 5.5 Use tools to check on ONRM's sanity and consistency
- 6 Troubleshoot the Fault Management Subsystem**
- 6.1 Explain the Fault Management Subsystem architecture
- 6.2 Explain Managed Components and Processes used in FM
- 6.3 Explain the basic features of GUI Alarm Viewers and FM NMS interfaces
- 6.4 Understand the flow of alarms
- 6.5 List and use troubleshooting tools at different FM internal interfaces
- 7 Handle AXE common applications and troubleshoot**
- 7.1 Explain the overall architecture of External Access Manager
- 7.2 Describe the main applications from EMT package (SRM, CLS & TGw)
- 7.3 Configure and Troubleshoot Telnet Gateway (TGw)
- 7.4 Use SRM and CLS
- 7.5 Explain the CNA architecture, the different Planned Area's and Jobs
- 7.6 Verify CNA operation and perform maintenance
- 7.7 Explain the concept of BCM/BSM Software
- 7.8 Troubleshoot BSM adjusts
- 7.9 Describe the concept and architecture of SMIA
- 7.10 Perform basic troubleshooting on SMIA
- 8 Handle IOG type AXE network elements in OSS**
- 8.1 Explain the basic interface on AXE IOG equipment
- 8.2 Explain the tools in OSS used to connect to AXE IOG nodes
- 8.3 Explain the way how configuration management is executed to AXE IOG nodes
- 8.4 Use tools troubleshoot access problems on AXE IOG nodes
- 8.5 Explain the FM interface to AXE IOG nodes
- 8.6 Explain the flow of alarm information from network element to FM Kernel
- 8.7 Use troubleshooting tools to verify alarm flow
- 8.8 Use configuration tools to customize the alarm reception
- 8.9 Explain the process of integrating a AXE IOG network element to OSS
- 8.10 Integrate a new AXE IOG network element to OSS
- 8.11 Use different tools to verify the interfaces to the new network element
- 8.12 Explain the simplified setup of statistical recordings on AXE IOG nodes
- 8.13 Explain the different tables on IOG holding PM related Configuration data
- 8.14 Explain by which entities recordings are produced and send to OSS
- 8.15 Verify the setup of SMIA and other recordings on AXE IOG nodes
- 8.16 Verify the flow of statistical recordings from AXE IOG through OSS SGW
- 9 Handle APG type AXE network elements in OSS**
- 9.1 Explain the basic interface on AXE APG equipment
- 9.2 Explain the tools in OSS used to connect to AXE APG nodes
- 9.3 Explain the way how configuration management is executed to AXE APG nodes
- 9.4 Use tools troubleshoot access problems on AXE APG nodes
- 9.5 Explain the FM interface to AXE APG nodes
- 9.6 Explain the flow of alarm information from network element to FM Kernel
- 9.7 Use troubleshooting tools to verify alarm flow
- 9.8 Use configuration tools to customize the alarm reception
- 9.9 Explain the process of integrating a AXE APG network element to OSS
- 9.10 Integrate a new AXE APG network element to OSS
- 9.11 Use different tools to verify the interfaces to the new network element

- 9.12 Explain the simplified setup of statistical recordings on AXE APG nodes
- 9.13 Explain the different tables on APG holding PM related Configuration data
- 9.14 Explain by which entities recordings are produced and send to OSS
- 9.15 Verify the setup of SMIA and other recordings on AXE APG nodes
- 9.16 Verify the flow of statistical recordings from AXE APG through OSS SGW

The following Objectives refer to OSS optional features. If selected by customers these Objectives can be added, extending the course by one course day.

10 Use and maintain the O&M Backup Solution (OMBS)

- 10.1 Explain the Netbackup layout
- 10.2 Configure Backup Profiles
- 10.3 Verify the backup execution
- 10.4 Perform restores

11 Handle the Statistical Data Mart (SDM)

- 11.1 Explain the SDM architecture
- 11.2 Explain interfaces for GSM, WCDMA and Core network statistical data
- 11.3 Verify SDM's operation
- 11.4 Perform basic troubleshooting on data load

12 Handle the High Availability Cluster Server Solution

- 12.1 Explain the HA Cluster Server solution
- 12.2 Perform Process Management on HA systems
- 12.3 Perform manual failover on HA Cluster Server

Target audience

The target audience for this course is: System Administrators

Prerequisites

The participants should be familiar with OSS operations applications related to GSM RAN
Suitable courses include:

GSM System Survey

LZU 108 852

Successful completion of the following external courses or equivalent knowledge:

Sybase: Fast track to Adaptive Server Enterprise

Sun: Solaris System Administration I and II

The participants should also be familiar with Veritas Volume Management and have general knowledge of TCP/IP and X.25.

Duration and class size

The length of the course is 5 days and the maximum number of participants is 8. If the optional chapters are included the course length extends to 6 days.

Learning situation

The course is based on instructor-led lessons and case-oriented exercises in a classroom equipped with an LCD-projector and a training environment where students use an OSS server with connections to either real or simulated network elements. The course is based on theoretical Instructor-led lessons given in a classroom environment.



Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Topics in the course	Estimated time
1	• Introduction	1h
	• User management	3h
	• Platform Architecture Process Management	3h
2	• Disk Mirror Handling / File-Systems	3h
	• Node Integration General and Data Handling	3h
3	• FM Architecture / FM Basic, Kernel / FM Viewer	3h
	• AXE Common Components	3h
4	• AXE IOG OSS Integration	2h
	• AXE IOG CM Interface / MML / EHM ETH	2h
	• AXE IOG FM Interface	1h
	• AXE IOG PM Interface, SGW and SMIA	2h
5	• AXE APG OSS Integration	2h
	• AXE APG CM Interface / MML / EHIP	2h
	• AXE APG FM Interface	1h
	• AXE APG PM Interface, SGW and SMIA	2h

APG 40 Delta (Windows 2003)



LZU 108 6455 R1A

Description

This course is developed with focus on characteristics and features offered by the APG40 on APZ 12.0 software level. The APG40 is an application platform complementing the AXE Central Processor by providing persistent storage, additional processing capacity and external connectivity based on open-standard communication protocols. The course describes the differences from previous product releases.

Learning objectives

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

- 1 Detail the different I/O systems delivered by Ericsson**
 - 1.1 Understand the hardware and capacity improvements
 - 1.2 Understand the data disk and the system disk structure
- 2 List the new Operating System (OS) functions in APG 40**
 - 2.1 Understand how to connect to an APG40 using Local Craft Terminal (LCT) and the Graphical User Interfaces (GUI)
 - 2.2 Understand the function of the Active Directory
 - 2.3 Describe how to work with Groups and Accounts
 - 2.4 Describe the IPsec tasks on APG40
- 3 Understand the new parameters for burbackup**
 - 3.1 Understand the new parameters for restore
- 4 Briefly describe how to upgrade the operating system from Windows NT to Windows 2003 Server**
- 5 Detail some new CP functions**
 - 5.1 Detail the new FTP configuration

Target audience

The primary target audience for this course: System Technicians and System Engineers.

Prerequisites

The participants should be familiar with the previous APG40 releases.

Duration and class size

The length of the course is 1/2 day and the maximum number of participants is 16.



Learning situation

This course is based on theoretical instructor-led lessons.

Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Topics in the course	Estimated time
1	<ul style="list-style-type: none">• Introduction• Operating System in APG40• APG40 Backup and Restore• OS Upgrade• Other Improvements	<p>30 min</p> <p>60 min</p> <p>40 min</p> <p>20 min</p> <p>30 min</p>

APG40 NT4 to Windows 2003 Delta



LZU 108 6456 R1A

Description

This course covers the Windows Server 2003 OS in APG 40. The APG40 in current release is based on commercial hardware and the Operating System (OS) is Windows Server 2003. The course Details the differences between Win2003 OS and WinNT4.

Learning objectives

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

- 1 Detail the APG40 / Win2003 architecture**
 - 1.1 Identify the layers and layer components in the Windows Server 2003 architecture.
 - 1.2 Know about the Server and Computer Roles of Windows Server 2003
- 2 Explain how the Active directory functions.**
 - 2.1 Provide a good understanding of the function of Active Directory
 - 2.2 The logical structure of Active Directory
 - 2.3 Working with Active Directory and the new administrative tools MMC
 - 2.4 Active Directory database files.
 - 2.5 Active Directory Sites concept.
 - 2.6 New domain controller roles and functionality.
 - 2.7 DNS.
 - 2.8 Naming conventions.
 - 2.9 DHCP
- 3 Manage Accounts, Groups and Resources in APG40**
 - 3.1 Detail and Manage user accounts
 - 3.2 Detail and Manage user groups
 - 3.3 Detail and Manage access to local and network resources
 - 3.4 Detail the Group Policy functionality in APG40
 - 3.5 Understand and manage domain account policies and user rights assignments
- 4 Explain how the Cluster functions with Win2003**
 - 4.1 Have a good understanding of Cluster concept.
 - 4.2 Have a good understanding of Key features.
 - 4.3 Have a good understanding of Cluster terminology.
 - 4.4 Have a good understanding of How cluster works
- 5 Detail the Disk Management and handle all related tasks**
- 6 Detail the Remote Desktop functionality and configure it.**
- 7 Detail the Network Monitor and the Recovery Console**
 - 7.1 Use recovery console for repair operations
 - 7.2 Use Network monitor to gather network information
- 8 Explain how the Virtual Directory is functioning**
 - 8.1 Have a good understanding of the function of Virtual Directory.
 - 8.2 Have a good understanding of the structure of Virtual Directory

9 Detail the functionality of 3rd Party Software used in APG40

- 9.1 Diskkeeper.
- 9.2 Etrust Antivirus.
- 9.3 Pragma Telnet Server

10 Detail the Backup and Restore procedure in APG40 and have a good knowledge on performing backup and restore operations**Target audience**

The primary target audience for this course: Service and System Engineers.

Prerequisites

The participants should have the competence both in APG40 and its Operating Systems (WinNT4 & Win2003).

Duration and class size

The length of the course is 3 days and the maximum number of participants is 8.

Learning situation

This course is based on theoretical and practical instructor-led lessons given in both classroom and in a technical environment using equipment and tools, which can be accessed remotely.



Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Topics in the course	Estimated time
1	• INTRODUCTION	0:15 h
	• ARCHITECTURE - SERVER ROLES	2:45 h
	• ACTIVE DIRECTORY	3 h
2	• MANAGE ACCOUNTS, GROUPS and RESOURCES	1:30 h
	• GROUP POLICIES	2 h
	• CLUSTER	0:30 h
	• DISK MANAGEMENT	0:30 h
	• REMOTE DESKTOP	0:30 h
	• RECOVERY CONSOLE	1 h
3	• NETWORK MONITOR	1 h
	• VIRTUAL DIRECTORY	1 h
	• THIRD PARTY SOFTWARE	0:30 h
	• BACKUP AND RESTORE	3:30 h

OSS-RC R3 Delta



LZU 108 6482 R2A



LZU 108 6482 R2A

Description

Are you looking forward to know the advantages of OSS-RC R3? If you already have experience with OSS RC R2 this course is for you. It will explain the new and enhanced features in the OSS-RC R3 (3.0/3.1). The course addresses the impacts of the Core Network 4.0 and 5.0, GSM RAN R12, WCDMA RAN P3.1 and P4 features on the OSS in the following work areas: Fault Management, Configuration Management, Performance Management & Optimization, and System Administration.

Learning objectives

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

- 1 List and identify the enhanced basic platform and common features for OSS RC following the student book and instructor explanations.**
 - 1.1 List and detail the enhancements in: OSS-RC Basic Services (CIF Platform), ONE, ARNE, AXE Element Management (EAM), OSS-RC Security and OCS, Fault Management Basic and Viewer, JM and OPS and in optional Backup and Restore solution
- 2 List and identify the enhanced basic features for GSM RAN comparing the previous version using student material and instructor explanations.**
 - 2.1 List and detail the enhancements in: Cellular Network Administration, AXE Element Management and in SMO AXE Software management ASM
- 3 List and identify the enhanced optional features for GSM RAN based on text information and instructor explanations**
 - 3.1 Explain purpose and benefit of: Neighboring Cell Support GSM-WCDMA (NCS-GW) to optimize the GSM to WCDMA handover list and further RNO improvements
 - 3.2 List and detail the enhancements in: RNR, RPMO, CNA PCP and in Base Station Configuration Management (BCM)
- 4 List and identify the enhanced basic features for the WCDMA RAN using the student text and instructor explanation**
 - 4.1 List and detail the new SMO WCDMA Software and Hardware Management Module (WSHM)
 - 4.2 Detail the enhancement in: WCDMA RAN Configuration Manager, Bulk CM and in Performance Management Administration (PMA/PMS)
- 5 List and identify the enhanced optional features for the WCDMA RAN discussing them using student text and instructor presentation.**

- 5.1 Explain purpose and benefit of: Consistency Checker and HSDPA Management, and Neighboring Cell Support WCDMA (NCS-W) to optimize the GSM to WCDMA handover list
- 5.2 Detail the new feature WCDMA RAN Surveillance eXpert
- 6 List and identify the enhanced basic features for the Core Network based on the class presentation and clarification.**
- 6.1 Detail the new SMO module J20 SW Management Module (JSM)
- 6.2 Detail the changes in SMO Cello Software Management Module (CSM)
- 7 List the enhanced and new optional features for Core Network using the student text and instructor explanation**
- 7.1 Detail the changes in the: M-MGW and MSC Configuration Manager and Import/Export CM Interface for Core Network, Number Analysis Manager, SNMP PM Data Mediation
- 7.2 Explain the new feature Core Network Status Monitor
- 7.3 Detail the changes in Core Network Configuration Tasks
- 8 Understand the upgrade procedure for major upgrade (from R2 to R3) and minor upgrades (CP installation)**
- 8.1 Explain the upgrade steps for both type of installations
- 8.2 Identify the affected systems
- 8.3 List the service windows and the effects to operation

Target audience

The target audience for this course is: Service Planning Engineers, Service Design Engineers, Network Design Engineers, Network Deployment Engineers, Service Deployment Engineers, System Technicians, Service Technicians, System Engineers, Service Engineers, Field Technicians, System Administrators, Application Developers, Business Developers, Customer Care Administrators.

Prerequisites

The participants should be familiar with OSS RC-R2.

Duration and class size

The length of the course is 1 day and the maximum number of participants is 16.

Learning situation

The course is based on instructor-led lesson in classroom or virtual classroom (VCT)



Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Topics in the course	Estimated time
1	Common Subsystems chapter	2,0 h
	GSM RAN related changes	1,0 h
	WCDMA RAN related changes	1,5 h
	Core Network related Changes	0,5 h
	Upgrade Procedure	1,0 h

GSM OSS R-PMO and TEMS Visualization



LZU 108 6484 R3A

Description

This course is intended for RF engineers involved in tuning, optimization and troubleshooting activities of GSM radio access networks. The focus of the course is on how to use the OSS tool **R-PMO (Real-time Performance Monitoring)** in OSS RC R3 and how to use **TEMS Visualization for GSM**. Some important Radio Network characteristics are explained and examples of how to interpret results and reports are discussed.

Learning objectives

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

- 1 Identify the purpose of R-PMO and TEMS Visualization**
- 2 Use R-PMO – Real Time Performance Monitoring**
 - 2.1 Activate R-PMO reports
 - 2.2 Monitor real time events e.g. Speech Quality, Drop rate, Handover Success
 - 2.3 Use REDE (Raw Event Data Export)
 - 2.4 Use RPDBI (R-PMO Database Export Interface)
 - 2.5 Explain how Business Objects can be used to create reports
 - 2.6 Create IMEISV Masks
 - 2.7 Create user defined Reports
- 3 Use TEMS Visualization**
 - 3.1 Import REDE (Raw Event Data Export) files to TEMS Visualization
 - 3.2 Explain the benefits of using TEMS Visualization for GSM
 - 3.3 Identify problem areas in a GSM radio access network
 - 3.4 Analyzing the causes of bad performance
 - 3.5 Search the database for certain behavior
 - 3.6 Be able to optimize timeslot allocation behavior



Target audience

The target audience for this course is: Service Planning Engineers, Service Design Engineers, Network Design Engineers.

Prerequisites

Successful completion of the following flow and courses:

GSM Network Fundamentals	FAB 102 1465
Cell Planning Principles	LZU 108 3273
GSM Radio Network Features	LZU 108 3704
GSM Radio Network Tuning	LZU 108 3298

Duration and class size

The length of the course is 1 day and the maximum number of participants is 8.

Learning situation

This course is based on theoretical instructor-led lessons and theoretical exercises given in a classroom environment.

Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Topics in the course	Estimated time
1	<ul style="list-style-type: none">• Introduction of R-PMO and TEMS Visualization• Description of R-PMO• R-PMO cases• TEMS Visualization for GSM	<p>1 h</p> <p>1 h</p> <p>2 h</p> <p>2 h</p>

APG 40 Operation and Maintenance (Windows 2003)



LZU 108 6567 R1A

Description

This course will introduce students to operational as well as maintenance issues on the APG40 platform (APG40C/2 and APG40C/4). After attending the course the students will be able to work practically with common APG40 handling tasks.

Learning objectives

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

- 1 Detail the APG40 hardware and software on an overview level**
 - 1.1 List the characteristics of all hardware boards and connections
 - 1.2 Explain how the APG40 is built up
- 2 Be able to use different interfaces to connect to the APG40 platform**
 - 2.1 Connect to the APG40 using Telnet, WinFiol or Terminal Server
- 3 Detail the Alarm System on an overview level**
 - 3.1 Detail how the AEH, ALH, and PRC co-operate to raise alarms
- 4 Define GOH data for the transfer of file and block outputs to remote destinations**
 - 4.1 Configure CDH, AFP and DBO functions for the transfer of data to remote systems
- 5 Collect statistics using STS**
 - 5.1 Configure the STS on APG40 to request, store and output counter data from the CP
- 6 Detail the concept AD-devices**
 - 6.1 Configure an AD-devices for command input and for routing of printouts
- 7 Load the CP from the APG40**
- 8 Complete a backup and restore of the APG40 platform**
 - 8.1 Handle the burbackup and burrestore commands according to the OPIs
 - 8.2 Use Hard Function Change and Soft Function Change to install new software and/or update parameters

Target audience

The target audience for this course is: System Technicians, System Engineers.

This audience are personnel working with Network Maintenance, Network Operation and System Administration.

Prerequisites

The participants should preferably have some knowledge of Windows 2003 Server and have AXE knowledge equal to the course LZU 108 6145 AXE Operation and Configuration or at least equal to the course: LZU 108775 AXE Survey

**Duration and class size**

The length of the course is 4 days and the maximum number of participants is 8.

Learning situation

This course is based on theoretical and practical instructor-led lessons given in both classroom and in a technical environment using equipment and tools, which are accessed remotely

Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Topics in the course	Estimated time
1	• Introduction	0.5 h
	• Accessing the APG40 Network	1 h
	• APG40 Hardware	2.5 h
	• APG40 Software	1.5 h
2	• APG40 Software	1h
	• APG40 Alarm System	3 h
	• File Management Subsystem	2 h
3	• File Management Subsystem	2 h
	• Man-Machine Communication Subsystem	2 h
	• APG40 Backup,	2 h
4	• APG40 Restore and Function Change	4 h
	• STS	2 h

APG40 Installation and Configuration (Windows 2003)



LZU 108 6568 R1A

Description

This course will prepare participants for installation and configurational tasks on the APG40. After the course the students will be able to install and put an APG40 into operation

Learning objectives

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

- 1 Start up and Test the APG40**
 - 1.1 Follow the Test Instruction, *Factory Start up and Test of APG40 – Windows Server 2003* to install and configure the APG40 for operation
 - 1.2 Change the site parameters
 - 1.3 Configure the DHCP Server on the APG40 if necessary
- 2 Understand the domain concept and know how a MUD can be set up and used**
 - 2.1 Use the User Manager for Domains to add trusts between domains
- 3 Add user accounts to the system**
 - 3.1 Add users with different access rights to the APG40 and to the CP
- 4 Define a configuration with two APG40s**
- 5 Migrate to APG40 from IOG20**
 - 5.1 Understand the main migration steps from IOG20 to APG40
- 6 Configure the Antivirus for APG40**
 - 6.1 Schedule virus scans and update the antivirus software definitions

Target audience

The target audience for this course is: System Technicians, System Engineers. This audience are personnel working with Network Maintenance, Network Operation, Network Development and System Administration.

Prerequisites

The participants should be familiar with Windows NT and have fulfilled the course LZU 108 6567 APG40 Operation and Maintenance (Windows 2003) and have AXE knowledge equal to the following course: LZU 108775 AXE Survey

Duration and class size

The length of the course is 2 days and the maximum number of participants is 8



Learning situation

This course is based on theoretical and practical instructor-led lessons given in both classroom and in a technical environment using equipment and tools, which are accessed both locally and remotely.

Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Topics in the course	Estimated time
1	Start Up, Configuration and Test of APG40	6 h
2	Authority System and User Account Management	3 h
	Configuration of two APG40s connected to the CP	1 h
	Migration of IOG20 to APG40	1 h
	Antivirus Configuration	1 h

GSM/WCDMA Intersystem Handover



LZU 108 6571 R1A

Description

This course focus on the intersystem handover between GSM and WCDMA. System Information parameters for controlling the cell re-selection and handover of an Ericsson Network in a mixed 2G/3G environment are examined. Counters, Timers and signalling flows are detailed and evaluated to optimize and troubleshoot intersystem handover related problems.

Learning objectives

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

- 1 Explain IRAT Handover**
 - 1.1 Evaluate the need for Intersystem Handover
 - 1.2 Explain different IRAT Handover strategies
- 2 Name the features related to Intersystem Handover**
 - 2.1 Name drawbacks of previous UTRAN releases
 - 2.2 Explain on overview level the features related to Intersystem Handover
- 3 Explain the process of PLMN Selection and radio access technology**
 - 3.1 Explain the PLMN selection process
 - 3.2 Analyze System Information parameters for interoperability between 2G and 3G networks
- 4 Explain Cell Selection process**
 - 4.1 Detail relevant parameters in the 3G network
 - 4.2 Detail the relevant parameters in the 2G network
 - 4.3 Know and set relevant timers
- 5 Explain Cell Re-Selection process**
 - 5.1 Detail relevant parameters in the 3G network
 - 5.2 Detail the relevant parameters in the 2G network
 - 5.3 Know and set relevant timers
- 6 Explain Handover between 2G/3G cells**
 - 6.1 Explain the intersystem handover process
 - 6.2 Explain the signaling flow
 - 6.3 Explain the need for Compressed Mode
 - 6.4 Know relevant parameters and timers
 - 6.5 List supported bearers
- 7 Evaluate the impact of Intersystem Handover on CS and PS services**
 - 7.1 Name the impact of Intersystem Handover on different services

Target audience

The target audience for this course are: Service Design Engineer and Network Design Engineer



Prerequisites

Successful completion of the following courses and flows:

WCMDA RAN Performance Management	FAB 102 1332
WCDMA RAN Protocols and Procedures	LZU 108 5886

Duration and class size

The length of the course is 1 day and the maximum number of participants is 16.

Learning situation

This course is based on theoretical instructor-led lessons and theoretical exercises given in a classroom environment.

Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Topics in the course	Estimated time
1	<ul style="list-style-type: none">• Overview & Strategy• RAN Features for Intersystem Handover• PLMN and Cell Selection• Cell Reselection• Handover• Impact of Intersystem Handover	<p>0.5 h</p> <p>0.5 h</p> <p>1 h</p> <p>1 h</p> <p>2 h</p> <p>1 h</p>

GSM RAN R12 Delta



LZU 108 6324 R1B



LZU 108 6324 R1B

Description

This course gives information related to changes between GSM RAN R11 and GSM RAN R12.

Learning objectives

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

1 Explain changes and news regarding Wireless Data

- 1.1 Active Queue Management
- 1.2 Application Aware Timeslot Allocation
- 1.3 Five Downlink Timeslots
- 1.4 GPRS/EGPRS Load Optimization
- 1.5 Flexible Channel Allocation
- 1.6 BSS R12 GPRS/EGPRS Improvements
- 1.7 Channel Repacking
- 1.8 Incremental Redundancy in Uplink
- 1.9 DTM Improvements
- 1.10 Admission Control for Push to Talk
- 1.11 Single Phase Access for EGPRS

2 Explain changes and news regarding Infrastructure and Architecture

- 2.1 Tandem Free Operation
- 2.2 Mega BSC-Support for 1024 Cells
- 2.3 Increased PCU Capacity
- 2.4 Enhancements to Flexible Abis
- 2.5 FR AMR on 8 kbps Abis
- 2.6 IP Connectivity
- 2.7 Gb over IP
- 2.8 SGSN in Pool
- 2.9 Mixed Micro Configurations

3 Explain changes and news regarding the Radio Network

- 3.1 Enhanced Measurement Reporting
- 3.2 SQS Enhancements
- 3.3 AMR Radio Link Timers
- 3.4 AMR Enhancements
- 3.5 Multi Layered HCS Enhancements
- 3.6 Enhancements related to Multi Band Cell
- 3.7 IRC Enhancements
- 3.8 Dynamic BTS/MS Power Control Enhancements
- 3.9 AMR Power Control

4 Explain changes and news regarding GSM/WCDMA Co-Existence

- 4.1 GSM-UMTS Cell Reselection and Handover
- 4.2 Combined Cell Reselection Triggering GSM to WCDMA
- 4.3 Urgency Handover
- 4.4 Smooth GSM-UMTS Unloading
- 4.5 Handover with the usage of Service Indicator

5 Explain changes and news regarding Operation and Maintenance

- 5.1 Pre defined configuration profiles
- 5.2 BTS O&M improvements
- 5.3 RNO Enhancements
- 5.4 R-PMO Enhancements
- 5.5 Statistics Enhancements
- 5.6 Enhanced Self Configuration Transcoder Pool

6 Explain changes and news regarding System Improvements in the BSC

- 6.1 Support of AXE 810 - APT 1.5

Target audience

The target audience for this course is GSM RAN System Engineers and others who need an overview over the changes in R12 release

Prerequisites

The participants should be familiar with Ericsson GSM RAN R11

Duration and class size

The length of the course is 1 day and the maximum number of participants is 16.

Learning situation

This course could be delivered either as an instructor-led training or via the web (Centra)



Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Topics in the course	Estimated time
1	<ul style="list-style-type: none">• Introduction• Wireless Data• Infrastructure and Architecture• Radio Network• GSM/WCDMA Co-Existence• BSS Operation and Maintenance and System Improvements	<ul style="list-style-type: none">.5 hours1.5 hours1.5 hours1.5 hours.5 hours.5 hours

GPRS/EDGE Radio Network Dimensioning



LZU 108 6647 R1A

Description

This course enables the students to plan and dimension a GSM GPRS network. The course includes the planning of parameters as well as the dimensioning for the GSM radio network nodes including EDGE.

Learning objectives

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

- 1 **Explain the architecture of the GPRS/EGPRS network**
- 2 **List the functionality of main GPRS nodes**
- 3 **Explain the concept and network changes related to Enhanced Data rates for Global Evolution (EDGE)**
- 4 **List the main differences between GPRS and EGPRS**
- 5 **Dimension the GPRS radio network, measure the performance and analyze the results to improve the performance**
 - 5.1 Apply GPRS/EGPRS Radio network dimensioning methodology
 - 5.2 Dimension a GPRS network for a CS1-CS4 traffic case
 - 5.3 Dimension a EGPRS network for a MCS1-MCS9 traffic case
 - 5.4 Use TEMS investigation results in the dimensioning procedure
 - 5.5 Dimension PCU for Ericsson BSCs

Target audience

The target audience for this course is: Network Design Engineers, System Engineers.

Prerequisites

Successful completion of the following courses:

GSM Network Fundamentals	FAB 102 1465
GSM Cell Planning Principles	LZU 108 3273

Duration and class size

The length of the course is 2 days and the maximum number of participants is 16.

Learning situation

This course is based on theoretical instructor-led lessons given in a classroom environment.

Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate. (This paragraph is mandatory).

Day	Topics in the course	Estimated time
1	<p>The GPRS/ EGPRS Network nodes and functions will be described in the following order</p> <ul style="list-style-type: none"> • Network Architecture • The role of SGSN, GGSN and BSC/PCU • Interfaces • High layer functions • Air interface and protocols • Radio Resource allocation 	3 h
	<p>This part will clarify what EDGE/EGPRS is and describe the impact in the GPRS network when introducing EGPRS. Topics explained:</p> <ul style="list-style-type: none"> • EDGE technology and modulation techniques • Link Adaptation and incremental redundancy 	3 h
2	<p>This part deals with the initial dimensioning and re-dimensioning. The following dimensioning methods will be explored</p> <ul style="list-style-type: none"> • Initial Radio Dimensioning based on basic assumptions, Business plan and simulations • GPRS CS1-CS4 dimensioning using TEMS investigation results and statistics • EGPRS Dimensioning and bandwidth calculations 	4 h
		2 h

IP Switch Operation and Configuration



LZU 108 6650 R1A

Description

If you still do not have competence on how to configure switch used to connect RAN nodes with core this course is for you. It will introduce students to switch theory and cover operational as well as maintenance issues on the Extreme 48s IP switch. It will also include work practically with common Extreme IP switch handling tasks.

Learning objectives

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

7 Identify all aspects of a switch hardware and software, interface connection and basic configuration

- 5.6 List the characteristics of all ports and connections used in the IP Switch Solution
- 5.7 Identify how the IP Switch fits into the big picture for Gb over IP solution
- 5.8 Use different interfaces to connect to the IP Switch platform
- 5.9 Connect to the IP Switch using Telnet, WinFiol or HyperTerminal
- 5.10 Understand the IP Switch software structure and Operating System
- 5.11 Recognize the IP Switch trap messages on an overview level
- 5.12 Identify how the IP Switch interfaces with OSS
- 5.13 Use ICMP type commands to test connectivity
- 5.14 Verify connectivity for O&M via the APG40 and IOG20

8 Set up an IP Switch and main configuration and administration tasks

- 5.15 View IP Switch settings within the BSC
- 5.16 Perform IP Switch configuration
- 5.17 Execute IP Switch configuration backup and restore

9 Configure IP switch applications using CLI commands

- 5.18 Understand the set up and support of IP applications in the BSC
- 5.19 Describe IPS applications R-PMO, GMLOG and OEN
- 5.20 Configure IP service applications

10 Perform IP Switch configuration changes using CLI

- 5.21 Understand IP addressing for the BSC IP connectivity
- 5.22 List valuable recommendations when implementing IP security in the BSC
- 5.23 Perform basic security configuration

Target audience

The target audience for this course is: Network Deployment Engineers, System Technicians, System Engineers, Field Technicians, System Administrators.



Prerequisites

Successful completion of the following flow and courses:

GSM RAN Network Surveillance

FAB 102 1465

GSM BSC Operation

LZU 108 625

Duration and class size

The length of the course is 2 days and the maximum number of participants is 8.

Learning situation

This course is based on theoretical and practical instructor-led lessons given in both classroom and in a technical environment using equipment and tools, which are accessed remotely.

Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Topics in the course	Estimated time
1	Module 1: IP Switch Introduction	6 hours
2	Module 2: BSC LAN Switches Configuration	2 hours
	Module 3: BSC IP Application Setup	2 hours
	Module 4: BSC IP Addressing and Security Guidelines	2 hours

APG40 Recovery Procedures (Windows 2003 C/4)



LZU 108 6726 R1A

Description

The APG40 is a very important part of the AXE switching solutions, especially in MSC, HLR and Telephony Softswitch applications. It is therefore important that the maintenance and support staff can recover APG40 nodes if problems arise.

This course will introduce students to the different recovery procedures available on the APG40. These procedures will be described in detail and performed practically on APG40 hardware.

After attending this course the students will know how to make a proper backup of the APG40 system to different media and to be able to use the different backups to recover the APG40 in a fast and correct manner.

Learning objectives

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

- 1 Perform a Health Check of an APG40C/4 System, (Windows Server 2003)**
 - 1.1 Use an audit script to check the status of a fault suspected APG40
- 2 Decide which Recovery Procedure to use**
 - 2.1 Choose between the existing methods for restoring an APG40 system
- 3 Understand the different types of Trouble Reports**
 - 3.1 Describe the different types of trouble reports and the information they contain
 - 3.2 Collect suitable information to be included in a trouble report
- 4 Make a proper backup of the APG40**
 - 4.1 Make a backup of the APG and transfer it to an LCT to be used for disaster recovery
- 5 Perform Restore on the APG40 system**
 - 5.1 Perform both single node and cluster node restore
- 6 Perform the AP, System Disaster Recovery OPI to restore an APG40C/4 (Windows 2003) System**
- 7 Restore one or both system disks on the APG40 from an LCT**
 - 7.1 Do a Quorum Restore on the APG40 System
 - 7.2 Restore the cluster quorum
- 8 Initiate a data disk restore on the APG40 System**
 - 8.1 Repair failed disks and get them up in an optimal state
- 9 Perform a node restore on the APG40 System**
 - 9.1 Follow the OP:I APG40, Node, Change, APG40 C/4 to change a node on in the APG40



Target audience

The target audience for this course is: Network Deployment Engineers, System Technicians, Service Technicians, System Engineers, Service Engineers, Field Technicians, System Administrators.

This audience can also all staff working both for Ericsson and for external companies with maintenance and support of APG40 systems.

Prerequisites

Successful completion of the following course or equivalent knowledge:

APG40 Operation and Maintenance (Windows 2003)

LZU108 6567

Duration and class size

The length of the course is 3 days and the maximum number of participants is 8.

Learning situation

This course is based on theoretical and practical instructor-led lessons given in both classroom and in a technical environment using equipment and tools.

Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Topics in the course	Estimated time
1	• Health Check	• 1 h
	• Different recovery methods	• 2 h
	• Trouble Reports	• 1 h
	• The backup procedure	• 2 h
2	• Recovery procedures: Restore	• 1h
	• Recovery procedures: Disaster Recovery	• 2 h
	• Recovery procedures: Quorum Log Restore	• 3 h
3	• Recovery Procedures: Data Disk Recovery	• 2 h
	• Recovery Procedures: Node Change	• 2 h
	• Other methods	• 1.5 h
	• Course Termination	• 0.5 h

GSM RBS 2108 Maintenance



LZU 108 6729 R1A

Description

If you need to perform hardware fault localization and replacement in RBS 2108, then this course is for you. The main focus of this task-based course is maintenance procedures including the usage of the necessary documentation to handle each process.

Learning objectives

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

1 Recognize and identify GSM Basic System and components using student material and instructor explanation.

- 1.1 Review the GSM/BSS structure and its interfaces
- 1.2 Explain the main LAPD configurations supported by RBS 2108
- 1.3 Identify the main characteristics of the RBS 2108
- 1.4 Detail the units, including connections, indicators (LEDs) and buttons
- 1.5 Detail the optional hardware of the RBS 2108

11

2 Review the radio site installation and connections, using the information with the User Guide.

- 2.1 Briefly explain the radio site installation
- 2.2 List some technical structural information of RBS 2108

12

3 Configure a RBS 2108 for RF connections, use some optional equipments, and execute basic connections in the RRU-C and DXU-MB using user guide and appropriate procedure

- 3.1 Explain the RBS radio configurations
- 3.2 Show the PCM settings in the MU
- 3.3 Set the RRU-C address
- 3.4 Determine when and how to implement UPS

13

4 Examine the maintenance process and perform the correct maintenance procedures based in the User Guide

- 4.1 Perform fault localization on RBS equipment with effective results
- 4.2 Perform simple repair procedures and replace faulty hardware units successfully
- 4.3 Monitor the fault status of the RBS using the OMT
- 4.4 Work according to the RBS maintenance process
- 4.5 Perform preventive maintenance on the RBS
- 4.6 Monitor internal and external alarms using the OMT
- 4.7 Perform tests on the RBS and antenna system

Target audience

The target audience for this course is: Field Technicians.



Prerequisites

Successful completion of the following courses:

GSM RBS 2X06/2X07/2112 Maintenance

LZU 108 5741

Duration and class size

The length of the course is 2 days and the maximum number of participants is 8.

Learning situation

The course is based on instructor-led lessons and practical exercises (case based learning).
The practical exercises are held in a lab environment similar to an ordinary radio site.

Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Topics in the course	Estimated time
1	• Course introduction	0,2 h
	• GSM RBS 2108 Maintenance Pre - Test	0,3 h
	• RBS Functional Overview	1,8 h
	• RBS Functional Overview Exercise and Cases	2 h
	• Site Equipment Technical Data	1,5 h
	• Site Equipment Technical Data Exercise	0,2 h
2	• RBS Configuration	1 h
	• RBS Configuration Exercises and Case	1 h
	• Maintenance Procedures	1 h
	• Maintenance Procedures Exercises	2 h
	• GSM RBS 2108 Maintenance Post – test	0,5 h
	• Course Conclusion and Evaluation	0,5 h

GSM System Survey



LZU 108 852 R6A

Description

Are you lost when discussing GSM network basic concepts? If you are starting working in different areas of GSM system and need a general concept this is the course you were looking for. It will provide you with knowledge about Ericsson's GSM based systems and GSM 800/900/1800/1900. It will focus on GSM terminology, wireless concepts, functions of network nodes, and the Ericsson implementation of those network nodes. Completing this training you will have all the initial knowledge you need to proceed in competence development in other areas.

Learning objectives

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


- 1 Understand how mobile systems have evolved over the time and tell the history of GSM development**
 - 1.1 List benefits of having a standard;
 - 1.2 Detail the GSM geographical network structure and node functions;
 - 1.3 Understand the GSM frequency bands;
 - 1.4 List subscriber services provided in the GSM network.

- 2 List Ericsson's GSM System divisions and components and perceive how Ericsson has been involved in GSM since its inception and took an active part in the GSM specification process.**
 - 2.1 List network components and Detail their functions;
 - 2.2 Briefly Detail optional additional network entities functions.
 - 2.3
 - 2.4 Know basic concepts of wireless communications and its importance to provide a good knowledge of how GSM Systems works
 - 2.5 Understand Time Division Multiple Access technique (TDMA);
 - 2.6 List the transmission problems and their solutions;
 - 2.7 Understand how Adaptive Multi-Rate (AMR) can increase capacity.

- 3 List and identify GSM System mandatory concepts of air interface, their functions and required specifications.**
 - 3.1 Understand the concepts of physical channel and a logical channel;
 - 3.2 List one important piece of information sent on each of 3 different logical channels;
 - 3.3 Briefly explain the idea of mapping.

- 4 Differentiate the platforms that provides the networks nodes and functionalities that are basis to provide Circuit and Packet switching, including AXE and CPP platform principles, list the main components and outlines the main features.**
 - 4.1 Understand the function of APT and APZ;
 - 4.2 Differentiate functions that can be implemented using AXE platform modularity;
 - 4.3 Explain how the group switch switches calls;

- 4.4 Discriminate the AXE 810 hardware structure;
 - 4.5 Discriminate the CPP Hardware Platform.
- 5 Explain how Ericsson implements the functions and nodes of the GSM switching system.**
- 5.1 Name 3 nodes in the Switching System;
 - 5.2 List which 2 nodes are contracted for the security procedure in the GSM system;
 - 5.3 Briefly explain the purpose of Authentication, Ciphering and Equipment Check;
 - 5.4 Know Ericsson Mobile Softswitch Solution.
- 6 List and identify Radio Access Network system nodes, its functions and required specifications**
- 6.1 Outline the main functions of a BSC, TRC and RBS;
 - 6.2 List the Ericsson's RBS 2000 configurations;
 - 6.3 Explain the RBS architecture and functional blocks.
- 7 Recognize different mobile stations types, including their components, functions, features and required specifications**
- 7.1 Outline the information stored on the SIM-card;
 - 7.2 Explain the advantage of having a separation between mobile equipment (ME) and subscription (SIM-card);
 - 7.3 List the product categories of Mobile Stations (MS).
- 8 Understand the GSM traffic cases to consolidate all the GSM Network concepts using basic traffic cases examples.**
- 8.1 Explain the purpose of GSM ID-number (MSISDN, IMSI, TMSI, MSRN and LAI);
 - 8.2 Understand the handover, locating and location updating concepts;
 - 8.3 Briefly Detail how a traffic case works.
- 9 Explain the basic concepts and difficulties of planning a cellular network based on text examples and explanations.**
- 9.1 Detail 3 stages in the cell planning process;
 - 9.2 Explain the terms Grade of Service (GOS) and 'Erlang';
 - 9.3 Name 2 types of Interference;
 - 9.4 Detail briefly the feature 'Re-Use of Frequencies within a Cell';
 - 9.5 Understand what is meant by the term 'Hierarchical Cell Structure';
 - 9.6 Detail briefly the feature 'BCCH in Overlaid Sub cell'.
- 10 Recognize Ericsson's Operation and Support System – OSS as an important tool for operation and maintenance in GSM network describing its features and functions**
- 10.1 Explain the functions of the Operations and Support System;
 - 10.2 Detail the architecture of the Operations and Support System;
 - 10.3 Outline the implementation of the Multi Mediation;
 - 10.4 Understand the implementation of the Ericsson Multi Activation.
- 11 List the most common and main subscriber services, explaining their functions, features, and specifications.**
- 11.1 List the different types of services available in the network;

- 
- 11.2 Identify one of each of the following service types in the network: teleservices, bearer services and supplementary services;
 - 11.3 Identify one of the Ericsson innovative services in the network;
 - 11.4 Briefly Detail the mobile intelligent network services available with Ericsson GSM systems ;
 - 11.5 Understand the need and advantages of the CAMEL system.
- 12 Understand charging and accounting concepts, their functions, features and required specifications, drawing attention to the fact that the charging concept is changing due to the introduction of new technologies such as GPRS, UMTS.**
- 12.1 Understand the charging concepts;
 - 12.2 List three call components;
 - 12.3 Explain the future of billing.
- 13 Discriminate how data calls are initiated in the GSM network and cite examples of how a data call is handled in a GSM network through a traffic case analysis.**
- 13.1 Explain the data transmission services which GSM offers;
 - 13.2 Detail a GSM data traffic case;
 - 13.3 List the data transmission services which GPRS offers;
 - 13.4 List the things that can lead to improved GPRS end-user performance;
 - 13.5 Detail a GPRS data traffic case.
- 14 Have an overview of the possible future functionality of GSM-based systems.**
- 14.1 Detail the evolution of GSM to WCDMA systems;
 - 14.2 List the technologies that will bridge these two systems including HSCSD, EDGE , GPRS , UMTS and HSPDA;
 - 14.3 Explain the 3G system and feature Adaptive Traffic Control.

Target audience

The target audience for this course is: Service Planning Engineers, Service Design Engineers, Network Design Engineers, Network Deployment Engineers, Service Deployment Engineers, System Technicians, Service Technicians, System Engineers, Service Engineers, Field Technicians, System Administrators, Application Developers, Business Developers, Customer Care Administrators.

Prerequisites

The participants should be familiar with telecommunication basics.

Duration and class size

The length of the course is 4 days and the maximum number of participants is 16

Learning situation

This course is based on theoretical instructor-led lessons given in a classroom environment.



Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

1	Course Introduction & pre-course test	1,0 h
	Introduction to Mobile Telecommunications and GSM	1,5 h
	Overview of Ericsson's GSM Systems	0,5 h
	Introduction to AXE and CPP	1,5 h
	Switching System	1,5 h
2	Radio Access Network	1,5 h
	Mobile Station	0,5 h
	Wireless Concepts	2,0 h
	Channel Concepts	2,0 h
3	Traffic Cases	2,5 h
	Cell Planning	1,5 h
	Operation and Maintenance tools	1,0 h
	Mobile IN and Subscriber Services	1,0 h
4	Charging and accounting	0,5 h
	Data Services	2,0 h
	The future of GSM	2,0 h
	Optional Components (Appendix A-B)	1,0 h
	Post-course Test	0,5 h

GSM RAN Signaling



LZU 108 857 R7A

Description

If you need the ability to explain the signaling taking place between nodes within the GSM Radio Access Network (RAN), this course is for you. You learn overall function of signaling in the Base Station System part of GSM and basic additional information for personnel also needing the knowledge of signaling in the Switching System part of GSM. This includes, understand the relationships about the terms MM, CM, RR, the protocols structure in GPRS and the protocols that responsible to carrier the informations between the nodes in the GSM network.

Learning objectives

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

- 1 List the nodes in the GSM system and the protocols used in GSM.**
- 2 Explain Channel Concept, and analyze the contents of control channels.**
 - 2.1 Understand the mapping of the logical channels in the Multi-Frame structure.
 - 2.2 Calculate the paging group of the mobile.
- 3 Differentiate signaling during different types of location updating and when location updating is performed in the system.**
 - 3.1 List nodes involved in setting up mobile originating calls
 - 3.2 Define the nodes involved in setting up mobile terminating calls
 - 3.3 Demonstrate signaling during handover
 - 3.4 Identify nodes involved in the transfer of mobile originating short messages
 - 3.5 Explain the nodes involved in the transfer of mobile terminating short messages
- 4 Explain System Information messages and how they are transmitted to the mobile**
 - 4.1 List the contents and the different system information messages
 - 4.2 Identify the general format of layer 3 messages on the radio and the message format in the air interface.
- 5 Identify when messages of different groups: MM, RR and CM, are used**
 - 5.1 Define the format of the data link layer protocol (LAPDm) messages used on the Um interface
 - 5.2 Explain how the layer 1 functions on the radio are implemented
 - 5.3 Detail the contents of the control channels like SCH, RACH and FCCH
 - 5.4 List the activities performed by MS:
 - In idle mode - cell selection and reselection
 - In active mode - providing measurement report
 - 5.5 Show the contents of the measurement report

- 6 Discriminate how the information carried between the BSC and the BTS is mapped onto the time slots of the PCM lines between them**
 - 6.1 Explain the AMR and DTX functions
 - 6.2 Detail the general format of the layer 2 protocol (LAPD) messages used on the A-bis interface
- 7 Explain briefly about Signaling System No.7 - SS7**
- 8 Recognize when the BSSAP protocol (MSC-BSC) is used on the A interface**
- 9 Explain about the Call Set-up and Location Updating**
- 10 Identify the GPRS Network structure**
 - 10.1 List the Protocols used in GPRS
 - 10.2 Explain NACC

Target audience

The target audience for this course is: Service Planning Engineers, Service Design Engineers, Network Design Engineers, Network Deployment Engineers, Service Deployment Engineers, System Technicians, Service Technicians.

Prerequisites

Successful completion of the following course:

- GSM BSC Operation LZU 108 852

The participants should be familiar with the GSM network.

Duration and class size

The length of the course is 4 days and the maximum number of participants is 16.

Learning situation

This course is based on theoretical instructor-led lessons given in a classroom environment.



Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Short description of the topics in the course	Estimated time
1	• Introduction to GSM nodes and protocols.	1,5 h
	• Channel concept and contents of logical channels	1,5 h
	• Mapping of logical channels in the multiframe structure.	1,5 h
	• TDMA frame up to Hyperframe structure	0,5 h
	• Paging group	1,0 h
2	• Traffic cases in GSM	2,0 h
	• What is System information and how is it transmitted to the mobile	0,5 h
	• Contents of the system Information messages	1,0 h
	• Description of CM, MM and RR messages	0,5 h
	• Layer 3 format of CM, MM and RR messages	0,5 h
	• Understand what is done in Layer 2 or LAPDm	1,0 h
	• Understand what is done in Layer 1 and contents of SCH, RACH and FCCH	0,5 h
3	• Idle mode behavior	0,5 h
	• Measurement report in Active mode	0,5 h
	• Format of a measurement report and measurement result	0,5 h
	• Detail AMR and DTX functions	0,5 h
	• Detail Abis Interface	0,5 h
	• Detail the general format of LAPD used in Abis Layer 2	0,5 h
	• Introduction to SS7	1,0 h
	• The Message transfer Part	0,5 h
	• SCCP	0,5 h
	• Detail BSSAP and BTAP Protocol	1,0 h
4	• Call set-up in GSM	1,0 h
	• Location updating in GSM	1,0 h
	• Detail GPRS network structure	2,0 h
	• Detail the protocols used in GPRS	1,0 h
	• NACC	1,0 h

GSM RAN Integration for Field Maintenance



LZU 108 871 R4A

Description

We will show you how to integrate a RBS in a BSC. You will learn about the definition of a new cell in a BSC and the meaning of the cell parameters, as well as how to use the relevant OSS-RC applications.

Learning objectives

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

- 1 Determine where the RAN Integration process – as part of the entire Cell Planning Process – comes in and the general steps to be taken for integration.**
 - 1.1 Discuss the Cell Planning Process
 - 1.2 Determine the Network Implementation Process
 - 1.3 Apply the RAN Integration Test
- 2 Discriminate the GSM RAN system and unit interworking identifying the individual components in the RAN system, both in the BSC and RBS, using student material and instructor explanation.**
 - 2.1 List the GSM Switching System components
 - 2.2 List GSM Radio Access Network (RAN) components
 - 2.3 Identify the two parts of the Operation Support System (OSS)
 - 2.4 Explain the BSC and TRC functional units
- 3 Recognize the various interfaces and protocols for those interfaces, studying the GSM topology and differentiating each other.**
 - 3.1 Identify and Explain the A, A-ter and A-bis interfaces
 - 3.2 Explain the characteristics of the Air Interface
 - 3.3 List the various Air Interface channels
- 4 Identify the RBS 2000 series nodes, their functionalities, capabilities and structure, using the student material and checking physically in the available BTS.**
 - 4.1 Explain the RBS architecture and functional blocks
 - 4.2 Differentiate various RBS 2000 family units
 - 4.3 List the Replaceable Units (RUs) in the RBS 2000
- 5 Apply the command structure used in RBS/BSC communication, using the WinFIOL software and command documentation.**
 - 5.1 Define the purpose of Man-Machine Language (MML) commands
 - 5.2 List various command parameters
 - 5.3 Interpret the format of commands
 - 5.4 Use ALEX to search for a given command
 - 5.5 Differentiate between CODs, PODs, and OPIs
 - 5.6 Explain the difference between “RL” and “RX” commands
 - 5.7 Given a list of commands, match a command with its function



- 6 Discuss cell-related concepts, obtaining cell definition, neighbor cell set-up, measurement reports, locating, and handovers entering commands and parameters, in practical exercises.**
 - 6.1 Express a high-level description of the cell/site integration process
 - 6.2 Identify cell-related parameters and data
 - 6.3 Create the necessary command file to define a cell
- 7 Define the Managed Object concepts, and the RBS in a functional-oriented way in the BSC point of view and create command files defining MOs**
 - 7.1 Define the Managed Object (MO) concept
 - 7.2 Identify the logical model for RBS 2000
 - 7.3 Explain the purpose of TEIs and DCPs
 - 7.4 Create the necessary command file to define a TG and its related MOs
- 8 Finish MO and Cell integration, using the WinFIOL and correspondent commands connected in the BSC.**
 - 8.1 Define the purpose of an RBLT device
 - 8.2 Identify the commands to bring an MO into service and to deblock it
 - 8.3 Execute the process of connecting a cell to a site
 - 8.4 Use the process of loading software into an RBS
 - 8.5 List various RBS maintenance commands

Target audience

The target audience for this course is: System Engineer and RBS Technicians.

Prerequisites

Successful completion of the following flow and course:

GSM Network Fundamentals	FAB 102 1465
GSM RBS 2x06/2x07/2112 Maintenance	LZU 108 874

Duration and class size

The length of the course is three 3 days and the maximum number of participants is 8.

Learning situation

This course is based on theoretical and practical instructor-led lessons given in both classroom and in a technical environment using equipment and tools.



Time schedule

The time required depends on the knowledge of the attending participants. The h stated below can be used as an estimate.

Day	Short description of the topics in the course	Estimated time
1	Course Introduction	1,0 h
	Chapter 1: Cell Planning Process	1,0 h
	Chapter 2: GSM RAN Overview	2,0 h
	Chapter 3: GSM RAN Interfaces	2,0 h
2	Chapter 3 GSM RAN Interfaces (continued)	1,0 h
	Chapter 4: RBS 2000 Functionality Overview	1,0 h
	Chapter 5: Command Handling	1,0 h
	Exercise 1: MML Commands	0,5 h
	Chapter 6: Cell-Related Concepts	1,0 h
3	Exercise 2: Cell Definition	1,5 h
	Chapter 7: Managed Objects	1,5 h
	Exercise 3: Managed Objects Definition	1,5 h
	Chapter 8: Cell/Site Integration	1,0 h
	Exercise 4: Cell/Site Integration	1,0 h
	Test and Evaluation	1,0 h

GSM RBS 2102/2202 Maintenance



LZU 108 874 R1C

Description

The purpose with this course is to supply newly employed BTS Field Maintenance personnel with competence needed for basic Maintenance procedures on RBS 2102/2202. It can be combined with other learning products such as, GSM RBS 2106/2206 Maintenance Delta, Mini-Link E Maintenance, and DXX/DXC Maintenance, to provide BTS site competence.

Learning objectives

After the course the participants will be able to:

- 1 **Perform fault localization on RBS equipment and antenna system**
- 2 **Perform simple repair procedures and replace faulty hardware units**
- 3 **Perform test after corrective action (e.g. test call, test of external alarms, climate system test and antenna system test)**
- 4 **Perform preventive maintenance routines on RBS 2102/2202 and the antenna system**
- 5 **Configure and install correct Installation Data Base, IDB using the Operation & Maintenance Terminal, OMT**
- 6 **Monitor internal and external alarms using the OMT**
- 7 **Monitor the fault status of the RBS using the OMT**
- 8 **Work according to the "RBS maintenance process" and interpret a work order from NMC/OMC**
- 9 **Upgrade the RBS with EDGE TRU**
- 10 **Perform preventive maintenance on the RBS and antenna system**
- 11 **Fill in a Repair Delivery Note ("Blue Tag") and a trouble report**
- 12 **Handle replaced units in a proper manner**
- 13 **Get familiar with EDGE Hardware Update**

Target audience

The target audience for this course is: System Technicians, Service Technicians, System Engineers, Service Engineers, Field Technicians

Prerequisites

The participants should be familiar with radio- and microwave technique and successful completion of the course :

GSM System Survey

LZU 108 852

Duration and class size

The length of the course is 3 days and the maximum number of participants is 8.



Learning situation

The course is based on instructor-led lessons and practical exercises (case based learning).

Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Topics	Estimated time
1	• Course introduction	0:30
	• RBS 2000 Library	0:15
	• BSS Overview	0:30
	• RBS HW-architecture	1:00
	• Maintenance process, OMT and MMI (Case 1)	3:00
2	• Review day 1 (Case 2)	0:30
	• Climate System and Battery Backup System	1:00
	• Trouble Shooting Power & Climate (Case 3)	2:45
	• Preventive Maintenance (Case 4)	1:00
3	• Antenna Systems	0:30
	• Filter- and Hybrid Combiner System (CDUs) & RBS 2102/2202 Configurations	0:45
	• Trouble shooting Radio Part (Case 5)	3:20
	• Trouble Shooting DXU (Case 6)	1:00
	• Course Conclusion and Evaluation	0:30

GPRS System Survey



LZU 108 876 R4A

Description

This course procures a basic introduction to the GPRS technology, the air interfaces for GSM (including EDGE) and WCDMA. The course includes traffic cases and Ericsson products within this field are presented.

The focus is on general principles rather than specific technical details.

Learning objectives

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

1 Explain the purpose of implementing packet switching in the existing GSM/WCDMA systems

- 1.1 Explain the differences between Circuit switching and Packet switching principles
- 1.2 Describe some of the GPRS Applications
- 1.3 List GPRS terminal features
- 1.4 Describe the general GSM/GPRS/WCDMA network Architecture
- 1.5 Illustrate how a terminal (Laptop or Smart Phone) uses the GPRS to access other networks such as corporate LAN or the internet
- 1.6 List and explain GPRS architecture

2 Explain on overview level the air interface in GPRS covering the GSM, including EDGE and/or WCDMA Systems

- 2.1 Explain GPRS Radio resource management including:
 - Dedicated or on-demand PDCH's
 - UL/DL resource allocation
 - Multi slot allocation
 - Radio resource management for UL/DL packet transfer
- 2.2 Understand GPRS throughput announcement, Coding schemes, Number of timeslots allocated, Protocol headers added to payload and Cell changing in GPRS
- 2.3 Describe the User plane bearers for WCDMA

3 Detail the traffic cases in GSM/WCDMA Networks for:

- Location Update
- Combined LA/RA update
- Cell update
- Paging
- PDP context Activation

4 Detail the functions and hardware for the WPP based SGSN for both GSM and WCDMA as well as GGSN based on J20

- CGSN
- SGSN
- GGSN J20



- 5 List the Software and Hardware required for GPRS in GSM / WCDMA**
- 6 Understand the protocol stacks associated with GSM Systems and WCDMA**

Target audience

The target audience for this course is:

Field Technician, System Technician, System Engineer, Service Engineer, Network Design Engineer, Network Deployment Engineer, Service Design Engineer, Service Deployment Engineer.

This audience includes personnel in charge of the operation or engineering of Ericsson GSM SGSN and/or WCDMA SGSN nodes.

Prerequisites

The participants should have successfully completed the following courses:

Ericsson WCDMA System overview (2 days ILT or VCT) LZU108 5418 or
GSM System Survey (4 days ILT) LZU 108 852

Duration and class size

Duration and class size depend on the course being delivered in either version:

- 1. Instructor Led Training (ILT) Version:

The length of the course is 2 days and the maximum number of participants is 16.

- 2. Virtual Classroom Training (VCT) Version:

The length of the course is 2 days and no more than 16 students participating in the VCT Sessions are recommended. Ericsson does not recommend Centra Sessions longer than 3 hours a day.

Learning situation

This course is based on theoretical instructor-led lessons given in a classroom environment, or given in a virtual classroom over the net by an instructor.



Time schedule

The time required always depends on the knowledge of the attending participants and the hours stated below can be used as estimate.

Day	Short description of the topics in the course	Estimated time
1	<ul style="list-style-type: none">• GSM/WCDMA Network Overview for GPRS	2 h
	<ul style="list-style-type: none">• GSM Air Interface for GPRS, including EDGE	2 h
	<ul style="list-style-type: none">• WCDMA Air Interface	2 h
2	<ul style="list-style-type: none">• Transport and Traffic Management	2 h
	<ul style="list-style-type: none">• SGSN and GGSN Hardware	2 h
	<ul style="list-style-type: none">• BSS Architecture for GPRS	1 h
	<ul style="list-style-type: none">• RAN Architecture for GPRS	1 h