



# **GSM RAN BSS 06B** Training Programs

## Package Description



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## 1 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.

## 2 Why invest in GSM RAN BSS 06B Package?

These comprehensive training programs have been developed to satisfy the competence needs of Ericsson customers in managing the Ericsson GSM BSS Network. They are intended to help you not just operate a more efficient network, but, through this greater efficiency, they will also help you increase customer satisfaction and thereby explore new business opportunities.

Each of these training courses is aimed at reaching a number of goals in managing the Ericsson GSM Radio Access Network:

- Better managing a complex network  
The Radio Access Network is a crucial, but complex, factor in a stable and successful mobile network. The training flows are aimed at improving competence areas at the network level.
- Optimizing investment  
The package provides dedicated courses for each technology and for each competence level. This reflects career models and allows for proper planning of each competence step in order to optimize the investment in training.
- Build and maintain competence with each system release  
This package outlines the competence build-up in dedicated work areas for different technologies, and allows you to maintain competence with each system release as the radio network technology advances through "Delta Training" and "Refresh" courses.
- Comprehensive competence  
From maintenance to integration and network planning; from overview level to advanced and

specialist knowledge: these courses present an entire spectrum of competence for all target groups.

- Learn the way that suits you best  
You can save time and eliminate travel costs by selecting Remote Learning (Web Based Learning – WBL) and Virtual Classroom Training (VCT). For an overview level of competence, WBL courses provide the student with a flexible tool and the opportunity to learn as required. Task-oriented learning methodology for maintenance training shortens the time taken for competence build-up.
- Structured Knowledge Transfer and Learning  
Solutions complement the GSM BSS 06 Training offering and link business needs with the competence development of the organization.
- Supporting the introduction of system features  
With the introduction of end-to-end features such as Abis over IP and Find faulty Antenna at network level, it becomes more and more important to understand the impact on the network and the work tasks, as well as performance increases and benefits for the operator and end user.

### 3 What's in the GSM RAN BSS 06B Package?

The following section describes each of the flows in details. Each flow states the prerequisite knowledge. The course flows are focusing on the following job categories.

#### Target Audiences

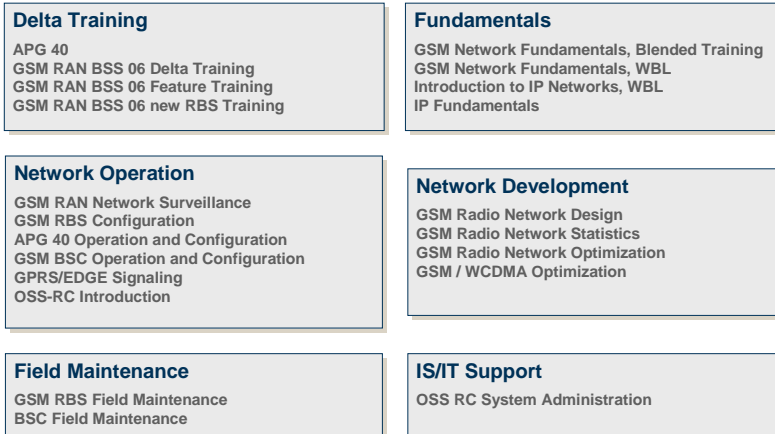


Figure 3-1: What's in the GSM RAN BSS 06B Package?



## 4 Delta Training

The GSM Delta training consists of two flows. The GSM RAN BSS 06 Delta training, FAB 102 1630 R1A is focusing on the changes in GSM RAN on features and system level including OSS-RC. Changes in AGP-40 are covered in the APG 40 Delta flow, FAB 102 1844.

### 4.1 GSM RAN BSS 06 Delta Training, FAB 102 1630 R1A

The GSM RAN BSS 06 Delta Training, FAB 102 1630 R1A, consists of two courses the GSM BSS 06 Delta, LZU 108 6645, and the OSS-RC 3 Delta, LZU 108 6482. The BSS 06 Delta course covers the changes from GSM R12 to BSS 06A and BSS 06B as well as the Abis over IP and Abis Optimization features. OSS-RC Delta, LZU 108 6482, covers the changes in OSS-RC from OSS-RC 2 to OSS-RC 3.

#### 4.1.1 What is achieved by attending the Flow

Participants attending this flow are familiar with handling the GSM RAN Equipment on GSM R12 level, and will after attending the flow be able to apply the handling of the new features and functions in their daily work tasks and potentially adapt their work procedures.

Are you looking forward to know the advantages of BSS 06? If you already have experience with GSM R12 the GSM BSS 06 Delta course is for you. It will explain the new and enhanced features in the GSM Radio Access Network. The course addresses the impacts on Wireless Data, Infrastructure, Architecture and Operation and Maintenance. The course is based on modules, which enables an easy customization of the course content.

OSS-RC R3, Delta course details 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-RC in the following work areas:, Fault Management, Configuration Management , Performance Management and Optimization, and System Administration.

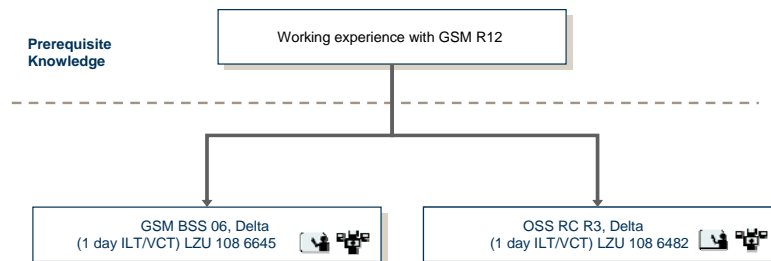
#### 4.1.2 Rationale for Flow design

The flow is divided into two courses to serve the needs of the different target audiences. It should be noted that there is a relation between new and enhanced features in the GSM RAN and new and enhanced OSS-RC application. The OSS-RC Delta course is focusing on the operational changes and the GSM BSS 06, Delta on the technical details.

### 4.1.3 Prerequisites

Working experience in GSM RAN R12 is a prerequisite to attend the GSM BSS 06 Delta Training, FAB 102 1630 R1A.

### 4.1.4 Training Flow



**Note:** The GSM BSS 06, Delta course consists of a ½ day GSM BSS 06A, Delta and a ½ day GSM BSS 06B, Delta. The course content can be customized to fit customers needs.

*Figure 4-1: GSM RAN BSS 06 Delta Training, FAB 102 1630 R1A*

## 4.2 GSM RAN BSS 06 Feature Training, FAB 102 1937 R1A

This flow focus on the introduction of the Abis Optimization, Abis over IP and Find Faulty Antenna system features.

### 4.2.1 What is achieved by attending the Flow

If you are spending a lot of money and time with drive tests, analyzing TEMS and/or MRR reports in order to find several spreading faulty antennas in the network and you would like to reduce this, be in the Find Faulty Antenna workshop. It explains how to use the Find Faulty Antenna feature to find problems related with misaligned antennas, feeder degradation, swapped feeders and other transmission problems.

If you want to improve your knowledge about Abis over IP and the implementation of Abis Optimization features, the Abis Optimization/Abis over IP workshop is for you.

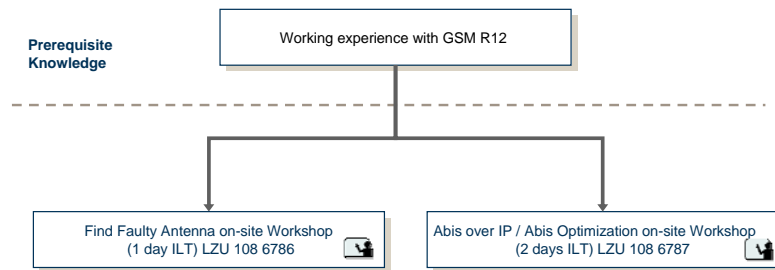
### 4.2.2 Rationale for Flow design

The flow consists of two independent on-site feature workshops.

### 4.2.3 Prerequisites

Working experience in GSM RAN R12 is a prerequisite to attend the GSM RAN BSS 06 Feature Training, FAB 102 1937 R1A.

#### 4.2.4 Training Flow



**Note:** The GSM BSS 06, Delta course covers the theoretical part of the two workshops.

*Figure 4-2: GSM RAN BSS 06 Feature Training,  
FAB 102 1937 R1A*

#### 4.3 GSM RAN BSS 06 new RBS Training, FAB 102 1946 R1A

In BSS 06 new RBS types are introduced. Low capacity products such as the RBS 2409 and the RBS 2308 can profitably expand capacity in areas otherwise impossible to reach. Other products, such as the RBS 2206/2106 and the RBS 2116/2216 macro base stations can be configured to provide as much capacity as needed



*Figure 4-3: RBS 2216, RBS 2116, RBS 2308, RBS 2409,  
RBS 2111 main-remote*

##### 4.3.1 What is achieved by attending the Flow

If you need to perform hardware fault localization and replacement in RBS 2308/RBS 2309 and RBS 2109, then the GSM RBS 2308/RBS 2309 and RBS 2109 Installation & Maintenance 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.

If you need to perform hardware fault localization and replacement in RBS 2108, then the GSM RBS 2108 Maintenance 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.

If you need to perform hardware fault localization and replacement in RBS 2111, then the GSM RBS 2111

Maintenance 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.

If you need to know the new concept and units of the RBS 2x16 and to perform hardware fault localization and replacement in RBS 2x16, then the GSM RBS 2X16 Maintenance Delta course is for you. The main focus of this task-based course is fault repair and maintenance procedures including the usage of the necessary documentation to handle each process. Also, you will see the new hardware concept implemented in the RBS to improve the capacity using the same footprint of the RBS 2206.

### 4.3.2 Rationale for Flow design

The flow consists of 4 independent courses. In the case several new models are introduced to a network, a customization of the single courses to a customer specific course flow is recommended to avoid overlapping.

### 4.3.3 Prerequisites

Working experience in GSM RAN R12, especially GSM RAN Field Maintenance, is a prerequisite to attend the GSM RAN BSS 06 Feature Training, FAB 102 1946 R1A.

### 4.3.4 Training Flow

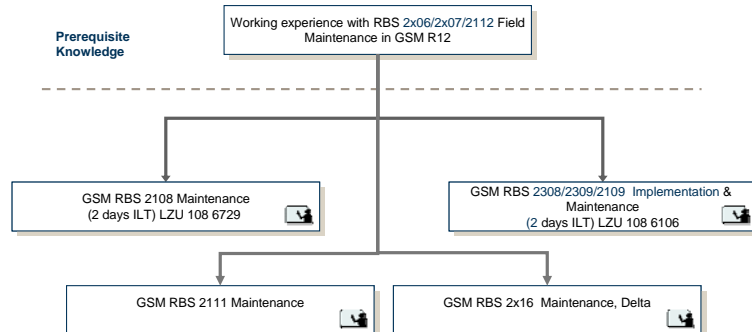


Figure 4-4: GSM RAN BSS 06 new RBS Training, FAB 102 1946 R1A

#### 4.4 APG 40 Delta, FAB 102 1844 R1A

With BSS 06 the operating system of the Adjunct Processor Group 40 (APG 40) is changed from Windows NT to Windows Server 2003.

##### 4.4.1 What is achieved by attending the Flow

The APG 40 Delta (Windows 2003) 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.

##### 4.4.2 Rationale for Flow design

The flow consists of one course.

##### 4.4.3 Prerequisites

Participants of the flow should have working experience with older versions of the APZ and APG 40.

##### 4.4.4 Training Flow

(FAB 102 1844 R2A)

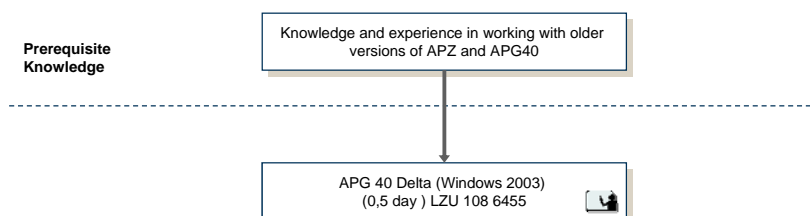


Figure 4-5: APG 40 Delta, FAB 102 1844 R2A



## 5 Fundamentals

The GSM Fundamentals consist of four flows: GSM Network Fundamentals, Blended Training, FAB 102 1465 and GSM Fundamentals, WBL; FAB 102 1947, IP Fundamentals, FAB 102 1314 R2A and Introduction to IP Networks, WBL, FAB 102 1313 R1A

All fundamentals are the foundation for the practical courses. With the right mixture of different learning methods, classical instructor led training, web based courses and virtual class room training, a blended learning program that suits your organizational setup and competence shift requirements, can easily be created.

### 5.1 GSM Network Fundamentals, Blended Training, FAB 102 1465 R1A

The flow consists of three courses the GSM System Survey, LZU 108 852, the GPRS System Survey, LZU 108 876 and the OSS-RC Overview, LZU 108 6739

#### 5.1.1 What is achieved by attending the Flow

Participants attending this flow will get a solid theoretical background in GSM and GPRS. The GSM network, the different hardware platforms, the GSM Air Interface and GSM evolution from a voice centric system to mobile data services are discussed on a generic, however sometimes detailed, technical level.

Are you lost when discussing GSM network basic concepts? If you are starting to work in different areas of the GSM system and need a general concept the GSM System Survey course 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.

The GPRS System Survey 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. This course can also be delivered as Virtual Classroom Training.

Participants attending the OSS-RC Overview course will be given a basic introduction to the Operation and Support System - Radio Core (OSS-RC). The OSS-RC is used for centralized Operation, Maintenance and Performance Management of mobile networks. OSS-RC can manage



Radio- (GSM) and Core Network (GSM and WCDMA) nodes. The participants of the course will be guided through the different applications of the OSS-RC and explore the functionality and purpose of the various applications.

### 5.1.2 Rationale for Flow design

This flow builds the solid foundation to understand the GSM System and the Ericsson solution. Starting with the GSM air interface, the functionality and roles of the different nodes, the flow is continued with detailed knowledge about the influence of GPRS and smart network operations with the help of the various OSS-RC applications.

### 5.1.3 Prerequisites

There are no prerequisites to this course flow. General telecommunication knowledge might be of advantage, though.

### 5.1.4 Training Flow

(FAB 102 1465 R2A)

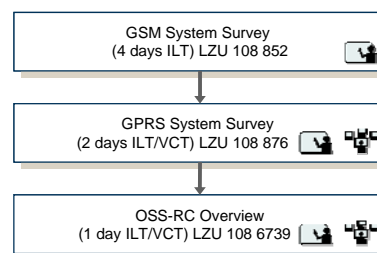


Figure 5-1: GSM Network Fundamentals, Blended Training, FAB 102 1465 R2A

## 5.2 GSM Network Fundamentals, WBL, FAB 102 1947 R1A

The GSM Network Fundamentals, WBL, FAB 102 1947 R1A consist of six courses in order to allow the participants to take the appropriate steps in learning, fitting their competence needs. Besides the GSM Radio Network Overview, all other courses can be taken in any order, with priority on the competence area where the participants see the biggest need. By having all the courses web based, a very flexible setup is provided to the learner to define their own pace of learning and control their learning progress. Learning can take place conveniently at the work place. This flow is an alternative to attending classroom training in the flow

### 5.2.1 What is achieved by attending the Flow

Participants attending this flow will get a solid theoretical background in GSM and GPRS. The GSM network, the



different hardware platforms, the GSM Air Interface and GSM evolution from a voice centric system to mobile data services are discussed on a generic, however sometimes detailed, technical level.

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

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

The GSM/WCDMA Traffic Cases 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.

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

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 GSM 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.

The GSM/WCDMA Transport Network Overview WBL 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.

## 5.2.2 Rationale for Flow design

The flow is divided into several courses in order to allow the participants to take the appropriate steps in learning, fitting their competence needs. Besides the GSM Radio Network Overview, all other courses can be taken in any order, with priority on the competence area where the participants see the biggest need. By having all the courses web based, a very flexible setup is provided to the learner to define their own pace of learning and control their learning progress. Learning can take place conveniently at the work place. This flow is an alternative to attending classroom training in the flow GSM Network Fundamentals, Blended Training, FAB 102 1465 R1A.

All WBL courses in this flow are available in a SCORM compliant version and could be interworking with a Learning Management System, also enabling to track the students' progress.

## 5.2.3 Prerequisites

There are no prerequisites to this course flow. General telecommunication knowledge might be of advantage, though.

## 5.2.4 Training Flow

(FAB 102 1947 R1A)

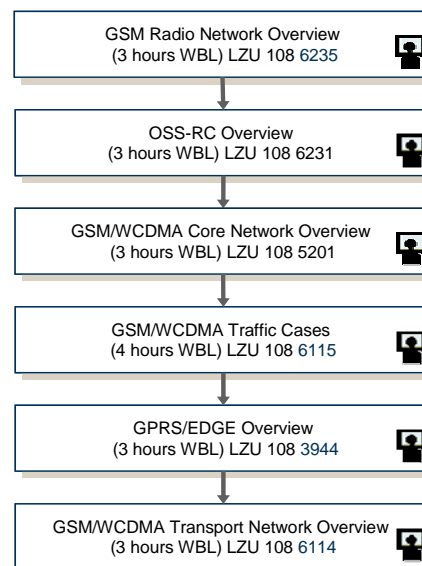


Figure 5-2: GSM Network Fundamentals, WBL,  
FAB 102 1947 R1A

## 6 Field Maintenance

The field maintenance training program is divided into two flows. The GSM RBS Field Maintenance, FAB 1021326 is dealing with the maintenance of various Radio Base Station types in GSM and the GSM BSC Maintenance flow is focusing on the maintenance of the AXE node, which is the common platform for Ericsson MSC, HLR, AUC, FNR, MSC-Server, BSC and Engine solution.

Similar tasks on various RBS types are when ever possible handled in one course in the GSM RBS Field Maintenance flow. Similarities of in-door and out door versions of the RBS and similar building practices of various RBS types lead to courses covering several RBS models in one course.

### 6.1 GSM RBS Field Maintenance, FAB 102 1326 R2A

This course flow covers the maintenance of GSM RBS. Based on the theoretical background of the fundamentals package, the participants gain hands-on experience on various RBS types.

#### 6.1.1 What is achieved by attending the Flow

If you need to perform hardware fault localization and replacement in RBS 2106/2206, RBS 2107/2207 and RBS 2112 family, then the RBS 2X06/2X07/2112 Maintenance course is for you. The main focus of this task-based course is on maintenance procedures including the usage of the necessary documentation to handle each process.

The GSM RBS 2308/2309/2109 Implementation and Maintenance course is intended to give the participants knowledge of how to install, perform testing and maintenance of the RBS 2308, RBS2309 and RBS 2109.

If you need to perform hardware fault localization and replacement in RBS 2108, then the GSM RBS 2108 Maintenance 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.

The purpose with the GSM RBS 2102/2202 Maintenance 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.

### 6.1.2 Rationale for Flow design

Based on the solid theoretical foundation of the GSM Fundamental package, field technicians get hands-on experience on various RBS models in this flow. Principals of the RBS maintenance are detailed and performed in the GSM RBS 2X06/2X07/2112 Maintenance and GSM RBS 2102/2202 Maintenance course. These two courses are followed by the GSM RBS 2308 Implementation and Maintenance and/or GSM RBS 2108 Maintenance course.

### 6.1.3 Prerequisites

Participants of this course flow should have attended either the courses of the training flow GSM Fundamentals, WBL, FAB 102 1947 R1A or the courses of the training flow GSM Network Fundamentals, Blended Training, FAB 102 1465 R1A.

### 6.1.4 Training Flow

(FAB 102 1326 R2A)

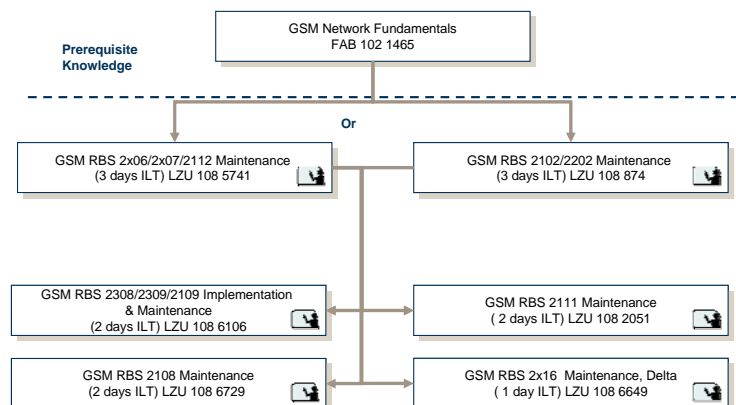


Figure 6-1: GSM RAN BSS 06 Delta Training,  
FAB 102 1630 R2A

### 6.2 GSM BSC Maintenance, FAB 102 1423 R1A

The BSC is one of several nodes in telecommunication networks based on AXE technology. Starting with standard maintenance tasks on AXE, the participants learn to follow maintenance routines and finding the right way through the online documentation of the node. The focus in this flow is to work on the equipment and understand by performing maintenance tasks the relation between the different components of the network, node and sub-systems.

## 6.2.1 What is achieved by attending the Flow

The GSM BSC Maintenance course enables the participants 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
- RPs, EMs, RPGs
- BSC-specific elements (TRAU, SRS)

The GSM Maintenance MSC/BSC Extended 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.

The AXE Emergency Handling course provides the students with the knowledge required to recover the AXE from fault

situations in critical parts, including stoppages in the Central Processor. During this course emergency situations are trained to prepare the participants on these rarely happening events in the life network, giving them time to evaluate the situation and follow in this critical situation the work procedures without damaging the network performance.

### 6.2.2 Rationale for Flow design

Hand-on experience is the driver for this flow. Starting with basic maintenance routines in the GSM BSC Maintenance course, the knowledge is tested and broadened to a solid foundation in MSC and BSC Maintenance after attendance of the GSM Maintenance MSC/BSC Extended. Emergency situations are trained and should be repeated on regular basis with the help of AXE 10 Emergency handling.

### 6.2.3 Prerequisites

Participants of this course flow should have attended either the courses of the training flow GSM Fundamentals, WBL, FAB 102 1947 R1A or the courses of the training flow GSM Network Fundamentals, Blended Training, FAB 102 1465 R1A.

### 6.2.4 Training Flow

(FAB 102 1423 R1A)

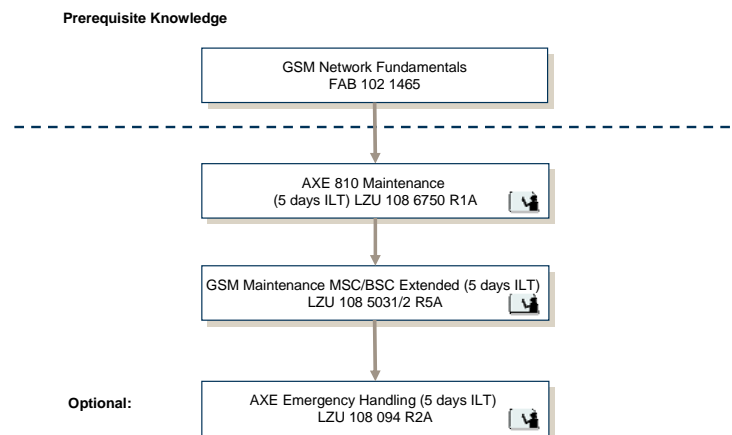


Figure 6-2: GSM BSC Maintenance,  
FAB 102 1423 R1A



## 7 Network Operation and Configuration

The network operation and configuration training program contains six flows. The first flow deals with the network surveillance for the GSM Radio Access Network. The second is focusing on RBS Configuration. The third flow details the operation and configuration of the APG 40, as one of the most important sub-system of the AXE. The fourth flow expands the competence gained in the network surveillance flow with specific knowledge in Base Station Controller operation and configuration. GPRS/EDGE Signaling is explained in theory in the GPRS/EDGE Signaling flow. The last flow in the network operation and configuration training program is the OSS-RC Introduction flow enabling the participants on-site to explore the possibilities and functionality of OSS-RC in a guided way.

### 7.1 GSM RAN Network Surveillance, FAB 102 1327 R1A

This flow covers tasks that are performed in network surveillance, from alarm handling to fault management. This way the flow is addressing a dedicated target group as well as a work area for personnel that will work in Network Surveillance in order to gain experience to continue in more advanced areas of network operation.

The course GSM Network Surveillance covers the methodology of network surveillance in hands-on classes.

The course Using the Fault Management eXpert (FMX) Tool discusses the use of FMX as a tool to develop and maintain an expert system for intelligent alarm handling, that is, to embody and apply expertise knowledge in rules, which are put into FMX modules. Automation of alarm handling and operational efficiency is achieved with the usage of FMX.

#### 7.1.1 What is achieved by attending the Flow

Participants are learning to apply the process of handling alarms and basic fault situations, learning the methodology of approaching new alarm situations using online tools. The course is task-oriented and uses a problem-oriented pedagogical method involving real-life situations, where the students have to work very actively. The focus is on learning standard procedures rather than covering every possible alarm situation. This is enabling the participants to react on new situations in a well-defined way and includes the escalation of alarms to the next level in the organization.

In the FMX course the participants learn how to create, develop and administrate FMX modules and rules. In a safe training environment the participants 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.

## 7.1.2 Rationale for Flow design

Different competence levels in Network Surveillance and Fault Management, from basic to advanced, make up this flow. All courses target personnel working in an operation center with a network management system.

The course Network Surveillance uses a network simulator together with the OSS-RC. This way the participants can be exposed to a higher number of alarms from different nodes in the network. Alarms are chosen to reflect typical situations in the network. Both Core Network and Radio Network components are part of the simulated network.

The Fault Management courses are based on the Ericsson OSS-RC, and would not apply for participants that will not work with this system.

## 7.1.3 Prerequisites

Participants of this course flow should have attended either the courses of the training flow GSM Network Fundamentals, WBL, FAB 102 R1A or the courses of the training flow GSM Network Fundamentals, Blended Training, FAB 102 1465 R1A.

## 7.1.4 Training Flow

(FAB 102 1327 R1A)

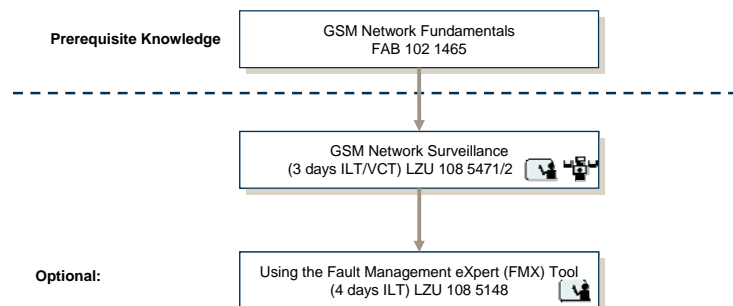


Figure 7-1: GSM RAN Network Surveillance, FAB 102 1327 R1A



## 7.2 **GSM RBS Configuration, FAB 102 1424 R1A**

The flow has two independent branches. The first branch is has a focus on the integration of a RBS into a GSM Network with OSS-RC and troubleshooting of the RBS in a GSM network. Besides the hands-on experience of the integration, the most important cell parameters and integration steps are detailed in theory.

The second branch has a focus on the PCB 6500 power cabinet.

### 7.2.1 **What is achieved by attending the Flow**

In the GSM RAN Integration for Field Maintenance course, 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.

If you need knowledge about advanced techniques of GSM RBS 2000 Troubleshooting, then this course is for you. The main focus of this task-based course is working with advanced techniques of fault repair and maintenance procedures including the usage of the necessary documentation to handle each process and understanding RBS related commands. The course includes remote fault analysis using commands in the BSC and the OMT software in the RBS for local analysis.

If you need to perform Power and Battery backup Cabinet (PBC) 6500 installation and maintenance for +24 and -48 V DC sites, then this course is for you. The main focus of this task-based course is in the installation and operation of the PBC 6500 solution in WCDMA and GSM networks. You'll learn about the functionality of the units involved, the handling of alarms and the onsite installation and configuration of the solution.

### 7.2.2 **Rationale for Flow design**

Based on RBS maintenance experience, participants of this advanced flow learn the integration and troubleshooting aspects of the RBS. Normally configuration and integration aspects are not part of the working tasks of the field maintenance personnel, however having this knowledge is valuable to be able to solve more complex RBS faults.

The flow consists of three courses, the GSM RAN Integration for Field Maintenance, LZU 108871, GSM RAN Troubleshooting, LZU 108 6779 and PCB 6500 Installation and Maintenance, LZU 108 6673.

### 7.2.3 Prerequisites

Participants of the GSM RAN Integration for Field Maintenance should have attended the GSM RBS 2x02/2x06/2x07 or 2112 maintenance course or have equivalent knowledge and working experience.

### 7.2.4 Training Flow

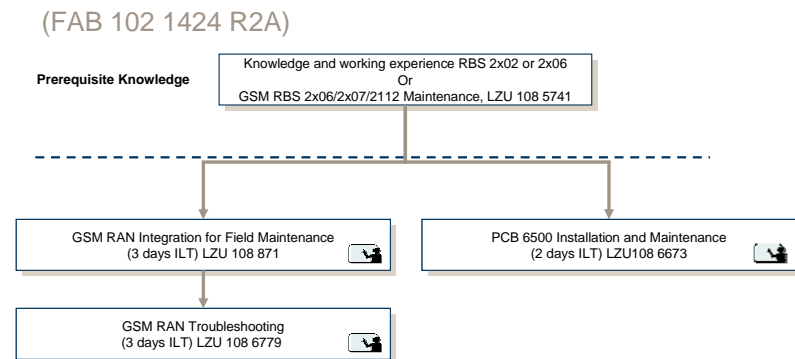


Figure 7-2: GSM RBS Configuration,  
FAB 102 1424 R1A

## 7.3 APG 40 Operation and Configuration, FAB 102 1847 R1A

APG 40 is one of the most important sub systems of the AXE. Providing the man-machine interface to the external world, being the mass storage device, handling of charging data and handling the statistic data are some of the key functions of the sub-system. Operation and configuration of this sub-system is special and that's why it is treaty in a separate flow. Standard maintenance tasks for APG 40, however are treated with the relevant AXE courses.

### 7.3.1 What is achieved by attending the Flow

The APG 40 Operation and Maintenance (Windows 2003) course will introduce students to operational as well as maintenance issues on the APG 40 platform (APG 40C/2 and APG 40C/4). After attending the course the students will be able to work practically with common APG40 handling tasks.

The APG40 Installation and Configuration (Windows 2003) course will prepare participants for installation and configuration tasks on the APG 40. After the course the students will be able to install and put an APG 40 into operation.

The APG 40 is a very important part of the AXE switching solutions, especially in BSC, MSC, HLR and Telephony Softswitch applications. It is therefore important that the

service and system engineer can recover APG 40 nodes if problems arise.

The APG 40 Recovery Procedures (Windows 2003 C/4) course will introduce participants to the different recovery procedures available on the APG 40. These procedures will be explained in detail and performed practically on APG 40 hardware.

After attending this course the participants will know how to make a proper backup of the APG 40 system to different media and to be able to use the different backups to recover the APG 40 in a fast and correct manner.

### 7.3.2 Rationale for Flow design

Based on working experience in AXE and Windows 2003, the participants of the flow get detailed theoretical and hands-on experience in the operation and maintenance of the APG 40. For System Administrator of the nodes, this knowledge can be expanded and deepened by attending the APG 40 installation and configuration course. Recovery procedures are in focus in the APG 40 Recovery Procedures course which is tailored for system and service engineers as well as system administrators of the APG 40.

### 7.3.3 Prerequisites

The participants attending this flow should have working experience with Windows 2003 and have attended the GSM AXE Operation course.

### 7.3.4 Training Flow

(FAB 102 1847 R1A)

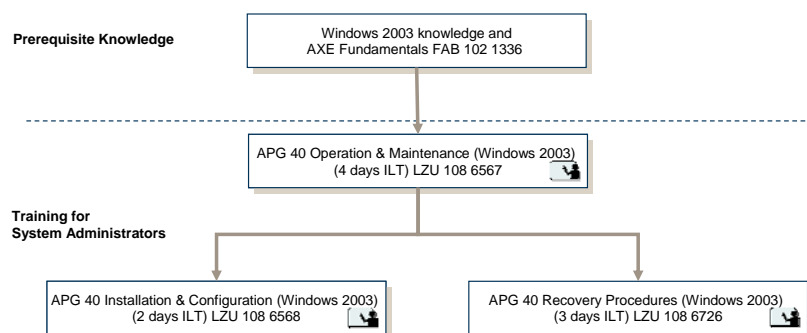


Figure 7-3: APG 40 Operation and Configuration, FAB 102 1847 R1A

## 7.4 **GSM BSC Operation and Configuration, FAB 102 1320 R1A**

Base Station Controller operation and configuration is the focus of this flow. In this blended learning flow, participants start with task oriented hands-on courses to operate the BSC and the IP Switch. GPRS specifics in the BSC are treated in the GPRS BSS Operation. For operators using OSS-RC, the GSM Radio Access Network is configured and managed in the GSM RAN Configuration and Management using OSS-RC course. The practical experience and knowledge is broadened by the GSM RAN Signaling course, enabling the students to get a detailed understanding of the signaling in the Base Station System.

### 7.4.1 **What is achieved by attending the Flow**

The task-oriented GSM AXE Operation course will enable the participants 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.

How can you correctly operate your controller without knowing the correct procedures? In the GSM BSC Operation 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.

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

The purpose of the GPRS BSS Operation course is to build up competence to perform operational procedures in the BSS of a GPRS Network.

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

## 7.4.2 Rationale for Flow design

The flow is divided into six courses. Two of the courses are optional. Operation of AXE and BSC is in focus in the first two courses: GSM AXE Operation and GSM BSC Operation. In the case GPRS configuration and operation in BSS are required; the GPRS BSS Operation covers this knowledge area. For Operators using the Extreme 48 Switch, the IP Switch Operation and Configuration course focuses on the configuration of the node. All three courses focus on the theoretical and practical configuration aspects, including parameter values and default settings.

The GSM RAN Configuration Management using OSS-RC course focuses on performing network changes with the help of the relevant OSS-RC applications based on the theoretical knowledge gained in the first three courses of the flow.

The practical experience and knowledge is broadened by the GSM RAN Signaling course, enabling the students to get a detailed understanding of the signaling in the Base Station System.

## 7.4.3 Prerequisites

Participants attending this flow, should have attended the GSM RAN Network Surveillance, FAB 102 1465.

## 7.4.4 Training Flow

(FAB 102 1320 R2A)

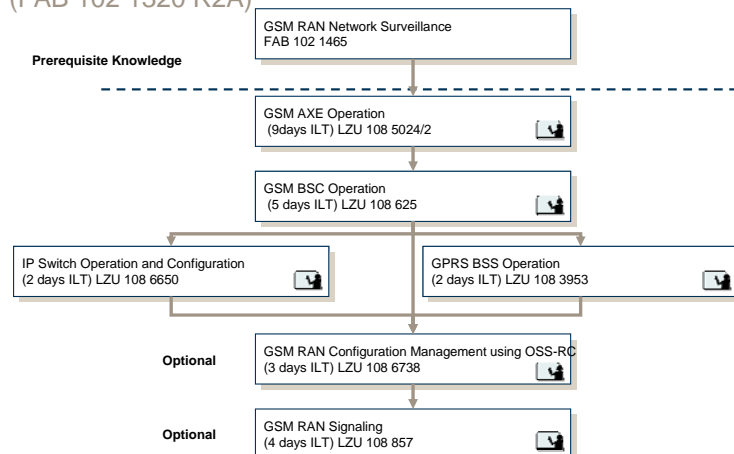


Figure 7-4: GSM BSC Operation and Configuration, FAB 102 1320 R2A

## 7.5 GPRS/EDGE Signaling, FAB 102 1660 R1A

GPRS/EDGE Signaling is in focus in this flow.

### 7.5.1 What is achieved by attending the Flow

The GPRS/EDGE Signaling 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.

### 7.5.2 Rationale for Flow design

The flow consists of one course, detailing the GPRS/EDGE Signaling.

### 7.5.3 Prerequisites

Participants of this course flow should have attended either the courses of the training flow GSM Fundamentals, WBL, FAB 102 1947 R1A or the courses of the training flow GSM Network Fundamentals, Blended Training, FAB 102 1465 R1A.

### 7.5.4 Training Flow

(FAB 102 1660 R1A)

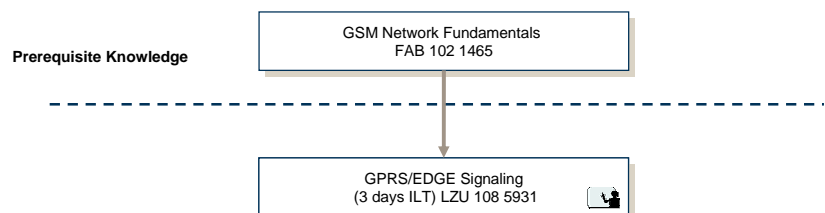


Figure 7-5: GPRS/EDGE Signaling,  
FAB 102 1660 R1A



## **7.6 OSS-RC Introduction, FAB 102 1379 R1A**

Network management is only possible with the Operation Support System Radio Core (OSS-RC). This on-site flow introduces the participants in the handling of the OSS-RC application in a guided way. Participants will perform operation, configuration and performance management tasks in a live network.

### **7.6.1 What is achieved by attending the Flow**

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 is covered in the course, as well as identifying trends in the network, predicting problems and optimizing the network as a result.

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

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.

### **7.6.2 Rationale for Flow design**

This flow consists of one course, based on the theoretical knowledge gained in the GSM Network Fundamentals sub-package.

### **7.6.3 Prerequisites**

Participants of this course flow should have attended either the courses of the training flow GSM Fundamentals, WBL, FAB 102 1947 R1A or the courses of the training flow GSM



Network Fundamentals, Blended Training, FAB 102 1465 R1A.  
Operational experience of AXE nodes is an advantage.

**7.6.4 Training Flow**

(FAB 102 1379 R1A)

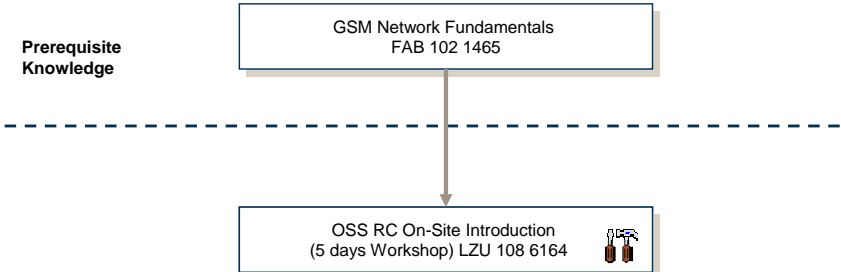


Figure 7-6: OSS-RC Introduction, FAB 102 1379 R1A



## 8 Network Development

The Network Development training program consists of four flows. The four flows cover GSM Radio Access Network Design, GSM Radio Network Statistics, GSM Radio Network Optimization and GSM/WCDMA Optimization.

### 8.1 GSM Radio Access Network Design, FAB 102 1425 R1A

This blended training flow covers the theoretical and practical aspects of the Radio Access Network Design of GSM networks including GPRS and EDGE. Cell planning tools like TEMS Cell Planner Universal user are used in the course to facilitate and automate the planning.

#### 8.1.1 What is achieved by attending the Flow

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

The GPRS/EDGE Radio Network Dimensioning 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.

Do you know how to plan a GSM network? Some planners have the software but do not use their complete capacity. During the GSM TEMS™ CellPlanner Universal User 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.

The GSM Cell Planning Workshop 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.

#### 8.1.2 Rationale for Flow design

The flow consists of four courses. Starting with Cell Planning Principals, the participants get the first experience in Cell Planning. This knowledge is expanded in the GPRS/EGDE Radio Network Dimensioning course with the particularities of packet radio network design. Cell planning with TEMS Cell Planner Universal User is in focus in the third course in the flow, followed by the GSM Cell Planning Workshop.

### 8.1.3 Prerequisites

Participants of this course flow should have attended either the courses of the training flow GSM Fundamentals, WBL, FAB 102 1947 R1A or the courses of the training flow GSM Network Fundamentals, Blended Training, FAB 102 1465 R1A.

### 8.1.4 Training Flow

(FAB 102 1425 R1A)

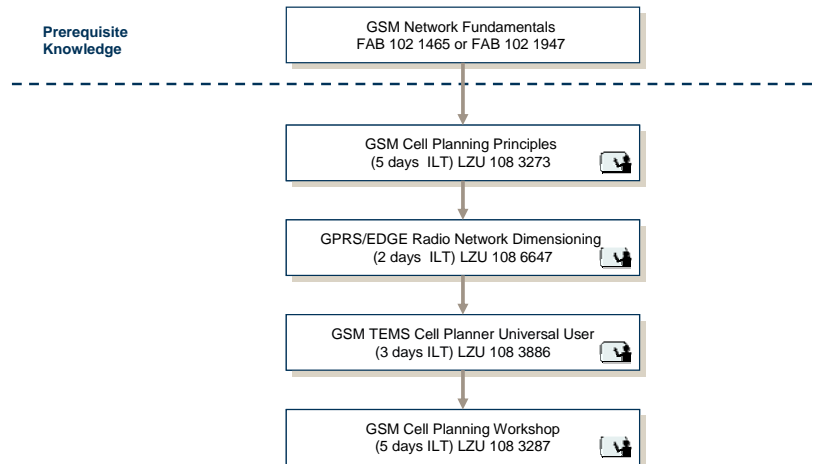


Figure 8-1: GSM Radio Access Network Design, FAB 102 1425 R1A

## 8.2 GSM Radio Network Statistics, FAB 102 1426 R1A

Radio network statistics are in focus in this flow. The first course in the flow, details the way measurements are performed in the Ericsson BSS and how to get information on the various counters. The second courses focus on the initiation of statistics with OSS-RC and taking standard reports on the performance of the network with the help of OSS-RC.

### 8.2.1 What is achieved by attending the Flow

If you need to understand and perform basics Statistics in the GSM Radio Access Network (RAN), the GSM RAN Statistics Introduction 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.

The NWS and Business Object workshop deals with the Network Statistics (NWS), optimization and troubleshooting of the radio network. The course focuses on how to use the tools for setting up new measurements, generate and manage

reports. Some important Radio Network characteristics will be explained and a few examples of how to interpret results and reports will be discussed.

No guidelines for optimization of the radio network or settings for cell parameters is included in this workshop.

## 8.2.2 Rationale for Flow design

The flow is divided into two courses. The GSM RAN Statistics Introduction is followed by the NWS and Business Objects Workshop. Through this sequence the participants first learn about the available statistics and how to get interpret them on node level, followed by network statistics and aggregation of statistical data in OSS-RC on network level in the NWS and Business Objects Workshop. It should be noted that no network optimization and no network tuning is part of the course flow.

## 8.2.3 Prerequisites

Participants of this course flow should have attended either the courses of the training flow GSM Fundamentals, WBL, FAB 102 1947 R1A or the courses of the training flow GSM Network Fundamentals, Blended Training, FAB 102 1465 R1A.

## 8.2.4 Training Flow

(FAB 102 1426 R1A)

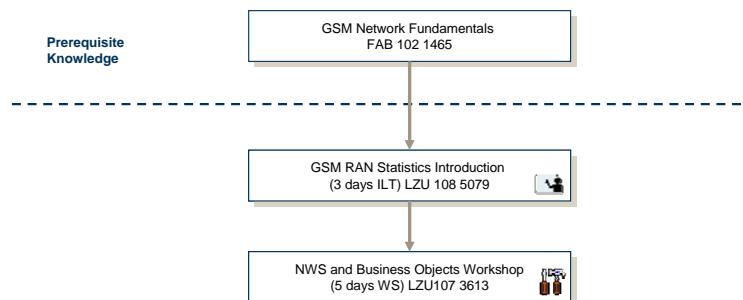


Figure 8-2: GSM Radio Network Statistics, FAB 102 1426 R1A



### 8.3 **GSM Radio Network Optimization, FAB 102 1427 R1A**

GSM Radio Network Optimization is performed in this flow. Based on solid understanding of the GSM Radio Network Features, the service and system engineer learn to tune and optimize a GSM network.

#### 8.3.1 **What is achieved by attending the Flow**

Get a grip on GSM Radio Network Features. In the GSM Radio Network Features course 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.

Get the initial tuning of a GSM radio network into focus. Through the GSM TEMS Investigation Workshop, 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.

The GPRS/EGPRS Radio Optimization Workshop 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.

The GSM Radio Network Tuning 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.

The GSM OSS R-PMO and TEMS Visualization 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 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.

Do you know how to use OSS for RAN optimization? If you want to improve your optimization tasks using OSS tools appropriately, the GSM OSS Radio Network Optimizers 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.

### 8.3.2 Rationale for Flow design

This flow consists of six courses, four of them are optional. A detailed understanding of the GSM Radio Access Network is required, to be able to tune and optimize a network. Optimization and tuning is only possible with the help of tools like TEMS Investigation, TEMS Visualization and Real-time Performance Monitoring of OSS-RC. As TEMS and OSS-RC are optional tools, the courses in the flow are optional as well.

### 8.3.3 Prerequisites

Participants of this course flow should have attended either the courses of the training flow GSM Fundamentals, WBL, FAB 102 1947 R1A or the courses of the training flow GSM Network Fundamentals, Blended Training, FAB 102 1465 R1A and the Cell Planning Principles, LZU 108 3273.

### 8.3.4 Training Flow

(FAB 102 1427 R1A)

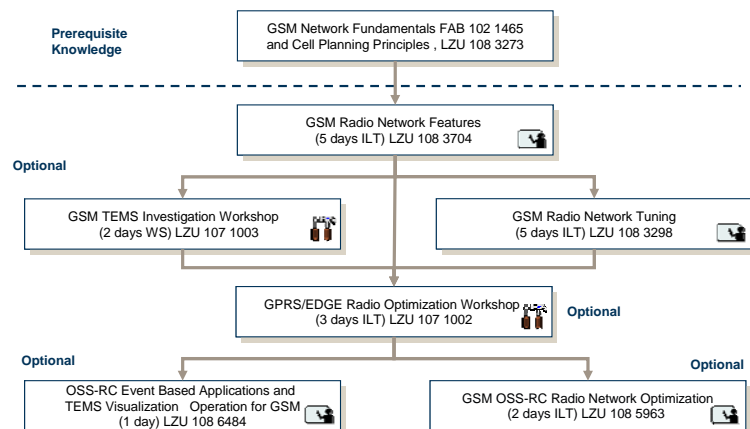


Figure 8-3: GSM Radio Network Optimization, FAB 102 1427 R1A

## 8.4 GSM/WCDMA Optimization, FAB 102 1938 R1A

Intersystem handover is in focus in this flow. In the theory course GSM/WCDMA the handover from GSM to WCDMA and vice versa is detailed.

### 8.4.1 What is achieved by attending the Flow

The GSM/WCDMA Intersystem Handover course focuses 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 signaling flows are detailed and evaluated to optimize and troubleshoot intersystem handover related problems.

### 8.4.2 Rationale for Flow design

The flow consists of one course. To take full advantage of this advanced topic it is absolute necessary to complete the GSM RAN Network Optimization flow, before attending this course.

### 8.4.3 Prerequisites

Participants attending this flow should have attended the GSM Radio Network Optimization flow.

### 8.4.4 Training Flow

(FAB 102 1938 R2A)

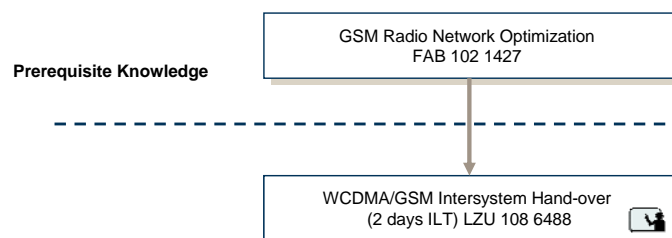


Figure 8-4: GSM/WCDMA Optimization, FAB 102 1938 R1A



## 9 IS/IT Support

The IS/IT Support training package is tailored for OSS-RC System Administrators and consists of one flow.

### 9.1 OSS-RC System Administration, FAB 102 1481 R1A

This flow is meant for system administrators and covers the standard maintenance and system administration tasks of an already running OSS-RC.

#### 9.1.1 What is achieved by attending the Flow

The OSS-RC System Administration course covers the routine maintenance activities, connection of various network elements and corrective maintenance on the OSS-RC platform and applications. Process and user management, the database structure as well as the security concept of OSS-RC are covered both theoretically and practically.

The course consists of modules with theoretical as well as practical sessions. The theoretical parts explain about the structure of the OSS-RC platform and the network environment. In the practical sessions the students will perform the tasks required to administer and maintain an OSS-RC.

Did you ever wonder where the parameters entered in the ARNE GUI are stored? Did you ever have a problem with Network Elements that do not appear in the FM, CNA or WCDMA CM applications after they have been created in OSS-RC? This course will describe fully where the information is stored and how to troubleshoot if something goes wrong in the Configuration Services, Notification Service, Directory Service or in any associated areas.

This course will describe all OSS-RC CIF platform-related software components. It will give a detailed explanation of their use in OSS-RC, possible problems and how to manage those problems. The course will further provide exercises dealing with recovery from severe platform-related problems.

#### 9.1.2 Rationale for Flow design

This flow is dedicated for system administration personnel who might also be working with system administration of other IS/IT systems, but in addition have GSM network node competence.

The course flow consists of two parts: a mandatory prerequisites part that introduces the participants in the administration of the 3<sup>rd</sup> party components of the OSS-RC like Solaris, Sybase and Veritas and an OSS-RC specific part, which consists of the OSS-RC System Administration and OSS RC Platform Troubleshooting course.

This way the prerequisite required for this flow might also apply for other tasks in the operator's infrastructure.

It should be noted that this is not an OSS-RC operation course, and neither does it give any information on how to operate or administer different telephony exchanges. Experience in operation and maintenance of GSM RAN nodes and a solid theoretical background in GSM RAN is an advantage for system administrators attending this course.

As OSS-RC is used in WCDMA and the Core Network, it should be noted that it is not recommended to attend the WCDMA, Core Network or IMS version of the course after attending the GSM version. Please ask your Learning Services Sales representative for a tailored version of the OSS-RC System Administration course.

### 9.1.3 Prerequisites

Participants of this course flow should have attended either the courses of the training flow GSM Network Fundamentals, WBL, FAB 102 1465 R1A or the courses of the training flow GSM Network Fundamentals, Blended Training, FAB 102 1947 R1A and IP Fundamentals, FAB 102 1314. System Administration on Sun Solaris, Sybase Database Administration and Veritas Volume Management are prerequisites as well for a successful completion of the course flow.

### 9.1.4 Training Flow

(FAB 102 1481 R2A)

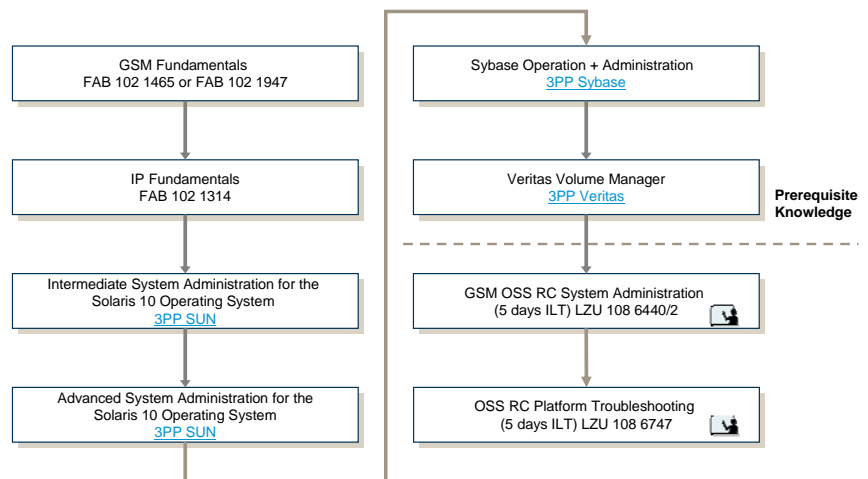


Figure 9-1: OSS-RC System Administration,  
FAB 102 1481 R1A

## 10 Related training packages

The following related training packages can be found at:

[http://www.ericsson.com/products/services/training/find\\_training.shtml](http://www.ericsson.com/products/services/training/find_training.shtml)

- WCDMA R5 Core Network
- GSM R12 Core Network
- WCDMA P5 Radio Access Network

The following Education Services can be found at:

[http://www.ericsson.com/products/services/training/learning\\_solutions.shtml](http://www.ericsson.com/products/services/training/learning_solutions.shtml)

- Learning Solutions
- Structured Knowledge Transfer (SKT)



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