Why this Course

Signaling & Advanced GSM Operation Techniques is a specially designed course to provide in-depth operational concepts of GSM Operations. This course starts with Signaling Basics, where more emphasis is on SS7 basics, then we deal with the various GSM specific signaling protocols. This course then moves in the life of cellphone, like mobile turn on, making calls, receiving calls, handovers, releasing calls etc.

This highly participative course covers all the cell database parameters, which are a key to network optimization. This course is definitely bringing your group the effectiveness in analyzing critical network operational issues.

Specifications

Course Type
Technology Training

Who Should Attend?
Switching, Planning, Optimization, Maintenance Engineers.

Prerequisites
GSM Basics or equivalent
Course Length
3 days

Course Format
100% lecture

Language
English

Delivery Method
Classroom

Handout
An extensive Students Manual with detailed notes will be provided which can be very well utilized for future reference. Major Contributing Organizations will be given one coloured handout copy.

Course Contents

Signaling Basics
- Signaling Methods
- CAS and CCS
- OSI Model
- SS7 Signaling Network and Model
- MTP Signal Units
- MTP Levels functions
- Signaling Links Management
- ISUP
- SCCP Connection Oriented Service
- SCCP Connectionless Service
- SCCP Routing and Addressing
- TCAP

Signaling in GSM
- GSM Signaling Matrix
- MAP
- MAP Addressing
- BSSMAP
- DTAP (MM,CC,SMS)
- LAPD
- RSL Messages
- Radio Interface
- LAPDm
- Coding of Channels on LAPDm
- LAPDm frame in a burst
- RIL3 messages
- Message Handling

Signaling Procedures
- Modes for MS – RR,MM,CC
- RR Management Procedures
- MM Management Procedures
- CC Management Procedures
- Subscriber Data Management

Channels and Frame Structures
- Physical and Logical Channels
- TDMA Bursts
- Logical Channels Functionality
- Mapping of Logical & Physical Channels
- Cell Channel Combinations
- Multitframes
- Superframe and Hyperframe Structures
- Frame Numbering

Mobile Camp On
- Criteria and Definitions
- Cell Selection and Reselection
- Cell Barring
- C1 Calculations
- Mobile Camp on Process
- Mobile Frame Synchronization
- Abnormal Camp on Cases
- Measurements for Cell Reselection
- C2 calculations
- Cell Prioritization
- Reselect Hysterics

System Information Messages
- Mapping on BCCH
- Type 1 Messages
- Type 2 Messages
- Type 2bis Messages
- Type 2ter Messages
- Type 3 Messages
- Type 4 Messages
- Type 5 Messages
- Type 5bis Messages
- Type 5 ter Messages
- Type 6 Messages
- Type 7 Messages
- Type 8 Messages
Mobile Cell Access
- Channel Request
- Immediate Assignment
- Immediate Assignment Extended
- Abnormal Cases
- RACH Collisions
- ALOHA Process

Security Procedures
- TMSI Reallocation
- Authentication
- Identification
- Ciphering
- IMSI Detach
- Abnormal Cases

Location Update Procedures
- Structured Procedure
- Update at VLR and HLR
- Types of Location Update
- Location Update Initiation
- Location Update Acceptance
- Abnormal Cases
- MS Purging

Mobile Originated Call
- Structured Procedure
- Service Request
- Setup, Alerting and Call Connection
- Abnormal Cases
- TCH Assignment
- Call Queuing
- Emergency Call
- Call Re-establishment
- Progress Indication tones

Discontinuous Transmission
- What is DTX
- Voice Activity Detection
- Comfort Noise Generation
- SID Frame Coding
- Downlink DTX operation
- Uplink DTX operation

Paging Procedure
- DRX
- CCCH Groups
- Paging Groups
- Calculation of Paging Groups
- Paging Modes
- Packing of Paging Messages

Mobile Terminated Calls
- MAP Procedures
- Page and Search
- Paging Response
- Setup
- Alerting
- Abnormal Cases

Roaming Procedures
- National Roaming
- International Roaming
- Location Update for a Roamer
- MSRN
- Location Update with TMSI
- Authentication for Roamer
- Routing of Incoming Calls
- Optimal Routing

Active Mode Procedures
- MS Measurement Reporting
- BTS Measurement Reporting
- Measurement Processing
- MS Power Control Algorithm
- BS Power Control Algorithm
- Handover Criteria’s
- Handover Algorithm
- Intra-BSC Handover
- Inter-BSC Handover
- Power Budget Handover
- Intra-cell Handover
- Abnormal Cases

Call Clearing Procedures
- Release of Call
- Release of Resources
- Radio Link Failure
- Idle Mode Link Failure
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Printed in the USA January 29, 2004
5989-0610EN