



## GSM Advanced Cell Planning

4 days

### 1. System Description

- GLOBAL SYSTEM FOR MOBILE COMMUNICATIONS (GSM)
- NETWORK HARDWARE
- OPERATION AND SUPPORT SYSTEM (OSS)
- SWITCHING SYSTEM (SS)
- BASE STATION SYSTEM (BSS)
- GPRS ARCHITECTURE
- AIR INTERFACE

### 2. Radio Frequency (RF) Guidelines

- RF GUIDELINES GSM 900/1800/1900
  - EQUIPMENT CHARACTERISTICS
  - CELL COVERAGE
  - CELL PLANNING
- CURVES OF JAKES'S FORMULA
  - CUMULATIVE NORMAL FUNCTION
  - SIMULATED LOG-NORMAL FADINGS MARGINS

### 3. Dimensioning of Logical Channels

- **SDCCH DIMENSIONING**
  - EVENTS THAT REQUIRE AN SDCCH
  - CHANNEL CONFIGURATIONS
  - AUTOMATIC SDCCH DIMENSIONING
  - MANUAL SDCCH DIMENSIONING
  - DIMENSIONING BASED ON STS-DATA
  - SUMMARY
- **LOCATION AREA DIMENSIONING**
  - PAGING CAPACITY IN THE BTS
  - ESTIMATED MAXIMUM LA SIZE
  - PAGING CAPACITY IN THE BSC
  - LA DIMENSIONING STRATEGIES

### 4. Antennas

- **ANTENNA PARAMETERS**
  - GAIN
  - BEAMWIDTH
- **ANTENNA DOWN TILTING**
  - ELECTRICAL TILT
  - MECHANICAL TILT
  - CELL PLANNING ASPECTS ON DOWN TILT
- **NULL FILL-IN**
- **DIVERSITY**
  - SPACE DIVERSITY
  - POLARIZATION DIVERSITY
- **INTERMODULATION (IM)**
- **BASIC ANTENNA TYPES**
  - OMNI-DIRECTIONAL ANTENNAS
  - UNI-) DIRECTIONAL ANTENNAS



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- LEAKING CABLES
- INDOOR ANTENNAS

#### 5. Antenna Near Products

- **BASIC REPEATER TYPES**
  - FREQUENCY REPEATERS
  - FREQUENCY SHIFTING REPEATERS
  - FIBER OPTIC REPEATERS
- **TOWER MOUNTED AMPLIFIERS**
  - ADVANTAGES OF TMA
  - DISADVANTAGES OF TMA
- **DUPLEXERS**
- **POWER SPLITTERS**
  - TWO-WAY POWER SPLITTER
  - THREE- WAY POWER SPLITTER
  - FOUR-WAY POWER SPLITTER
- **HYBRID COUPLERS**
- **COMBINERS**
  - FILTER COMBINER
  - HYBRID COMBINER
  - COMBINER AND DISTRIBUTING UNIT (CDU)

#### 6. Propagation Algorithms

- **PROPAGATION ALGORITHM, 9999**
  - VALIDITY
  - INPUT/OUTPUT DATA
  - OVERVIEW OF ALGORITHM BLOCKS
  - DESCRIPTION OF ALGORITHM
  - TERMINOLOGY
- **URBAN MODEL**
  - VALIDITY
  - INPUT/OUTPUT DATA
  - INPUT DATA FOR THE RECURSIVE MICROCELL MODEL
  - OUTPUT DATA
  - DESCRIPTION OF THE ALGORITHMS
  - TERMINOLOGY

#### 7. Site Survey

- **SITE SURVEY CONSIDERATIONS**
- **INSTRUMENTS FOR SITE SURVEYS**
- **PRE-SITE SURVEY PROCEDURES**
- **SURVEY PROCEDURES**

#### 8. Tools

- **TRANSMITTER (TTM)**
- **OPTIMIZATION SOLUTIONS**
- **GLOBAL POSITIONING SYSTEM (GPS)**
- **OPERATIONS SUPPORT SYSTEM (OSS)**

#### 9. Indoor Cell Planning

- **CAPACITY DIMENSIONING**
- **ANTENNA AND RBS SYSTEMS - OVERVIEW**
- **RBS PRODUCTS**



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- **RF DESIGN**
- **ANTENNA CONFIGURATION**
- **FREQUENCY PLANNING**
- **TRAFFIC CONTROL**
- **STUDY CASE**
- **DESIGN CRITERIA**
- **FLOOR PLANS**

10. Network Expansion

- **CELL SPLIT**
- **GSM HIGH CAPACITY SOLUTIONS**
- **WAY FORWARD TO CAPACITY**

11 GPRS impact on the radio network

- **GPRS SYSTEM OVERVIEW**
- **GPRS RADIO RESOURCE HANDLING**
- **IMPACTS ON THE RADIO NETWORK**