2G, 3G Network Planning and Optimization...

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Постоянные читатели

4.4 Parameters Affecting Network Functions

4.4.1 Newly Established Cause Indicator (NECI)

I. Definition

In a GSM network, the traffic channel (TCH) consists of full-speed TCH and half-speed TCH. When the network supports half-speed TCH, the MS is informed of whether the area supports half-speed TCH by NECI.

II. Format

The value of NECI includes Y and N, with the meaning as follows:

- Y means that the area support half-speed TCH.
- N means that the area cannot support half-speed TCH.

III. Configuration and Influence

Half-speed TCHs enable each carrier to support more traffic channel, but you must confirm whether the system support half-speed TCH.

4.4.2 Power Control Indicator (PWRC)

I. Definition

The PWRC informs MS of whether to take statistics of downlink level of BCCH carrier slot for measuring average value when the BCCH frequency participates in frequency hopping. The causes to configuring PWRC are as follows:

- GSM regulations allow frequency hopping channels to use BCCH (frequency hopping not in BCCH slots).
- GSM regulations allow downlink power control over frequency hopping channels.
- The MS needs signal level of the measured neighbor cells, so the power of each slot on BCCH frequency is prohibited to change. The downlink power control does not involve carrier slots for BCCH which includes the frequency hopping.

For previous causes, when the MS measures the average downlink channel level with common methods, the measurement result is inaccurate for power control because the average value includes the downlink received level of BCCH carriers the power of which are not controlled, so the measurement report is inaccurate for power control.

To avoid the influence on power control, when the MS calculates average received level during frequency hopping, the received level obtained from BCCH carrier slot must be removed (see GSM regulations 05.08).

II. Format

The value of PWRC includes 0 and 1, with meanings as follows:

- When PWRC is 0, the measurement result by MS includes BCCH carrier.
- When PWRC is 1, the measurement result by MS does not include BCCH carrier.

III. Configuration and Influence

The PWRC is usually configured to 0. Configure it to 1 if all the following conditions are met:

- Channels have frequency hopping on two or more frequencies.
- One of the frequency is BCCH carrier frequency.
- The system uses downlink power control.

IV. Precautions

The value of PWRC depends actually on the following parameters:

- Whether to use frequency hopping.

- Whether to use frequency hopping.
- Whether the hopping frequency includes BCCH carrier.
- Whether the system uses downlink power control.

4.4.3 Discontinuous Transmit of Uplink

I. Definition

Discontinuous transmit of uplink (DTXU) refers to the process for MS not to transmit signals during silent period (see description about DTX in Chapter 2).

II. Format

Whether the network allows uplink to use discontinuous transmit (DTX) is set by equipment room operators. DTX ranges from 0 to 2, with the following meanings:

- 0: MS can use DTXU.
- 1: MS must use DTXU.
- 2: MS cannot use DTXU.

III. Configuration and Influence

Using uplink DTX affects call quality, but it is helpful in the following aspects:

- Lower interference to radio channels.
  Due to this, the average call quality of network is improved.
- Cut power consumption by MS

For the previous advantages, DTX is recommended to use.

4.4.4 Discontinuous Transmit of Downlink

I. Defintion

Discontinuous transmit of downlink (DTXD) means the network does not transmit signals during silent period.

II. Definition

DTXD is in string, and the range is YES and NO. The meanings are as follows:

- YES: Downlink uses DTX.
- NO: Downlink does not use DTX

III. Configuration and Influence

Using downlink DTX affects call quality in a limit scale, but it is helpful in the following aspects:

- Lower interference to radio channels.
  Due to this, the average call quality of network is improved.
- Reduce load of base station CPU

Therefore, if possible, you use DTX

IV. Precautions

According to GSM regulations, downlink DTX is optional. If the base station equipment supports DTXD, then use it. However, you must ensure that voice transcoder is available to support DTXD.

4.4.5 Call Resetup Allowed

I. Definition

When coverage voids cause radio link failure, consequently call drop, the MS starts to resetup the call for recovery. Whether resetting up the call is allowed depends on the parameter call resetup allowed (RE).

II. Format

The values of call resetup allowed are 1 and 0, with meanings as follows:

- 1: Call resetup is allowed in the cell.
- 0: Call resetup is forbidden in the cell.

III. Configuration and Influence

When a connected MS passes coverage voids, call drop occurs easily. If call resetup is allowed, the average call drop rate (CDR) is lowered. However, call resetup takes longer time, and most users disconnects before completion of call resetup. Therefore call resetup is difficult to achieve, and even wastes abundant radio resources. In a word, call resetup is disabled.

4.4.6 Emergency Call Allowed

I. Definition

The following MSs cannot enjoy various services:

- MS without SIM
- MS with ACC as one of C0 to C9 and with cell_bar_access

The parameter emergency call allowed (EC) determines whether the MS is allowed for emergency calls, such as police emergency call.

II. Format

EC consists of 1 bit. For the MS with ACC of C0 to C9 or without SIM, the EC is NO, meaning emergency call forbidden. YES means emergency call allowed. For the MS with ACC of C11 to C15, when both the access control bit and EC are configured to forbidden, it is forbidden for emergency calls.

III. Configuration and Influence

According to the GSM regulations, the emergency number is 112, different from that in China. The Chinese emergency call cannot function as prescribed in GSM regulations. For international roaming users, set 112 to answerphone to inform users of various special service numbers. Therefore, setting emergency call must be allowed through configuring radio parameters, namely, configure EC to 1.

4.4.7 Early Classmark Sending Control

I. Definition

In a GSM network, the MS classmark marks the following aspects:

- Service capacity
- Supported frequency band
- Power capacity
- Encryption capacity

Classmark consists of classmark1, classmark2, and classmark3. A GSM MS. In a GSM network, the MS reports Classmark1 or Classmark2 information immediately after ESTIND<CM SERV REQ> (corresponding to L2-SABM at Um interface) is allocated. Classmark3 (CM3) information includes power information of various frequency band of multi-frequency MS.

During handover between different bands, the power class must be correctly described. When the GSM system pages and transmits BA2 in different bands, it must know the CM3 message. In GSM regulation Phase2plus, early classmark sending control (ECSC) is added. ECSC means that by SI the system informs MS of reporting Classmark3 after link setup. This avoids querying process by network.

II. Format

The values of ECSC are Y and N, with the following meanings:

- Y: The MS reports Classmark3 to the network immediately after link setup.
- N: The MS is forbidden to report its Classmark3 to network initiatively.

III. Configuration and Influence

The major information of Classmark3 is for dualband network, so do as follows:

- Configure ECSC to N in single frequency GSM application areas.
- Configure ECSC to Y in dualband GSM application areas.

IV. Precautions

In a dualband network, configure the parameter of all cell to the same value. Configuring the parameter to different values in one or more cells is forbidden; otherwise, the network quality declines.

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