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**Police digital trunking communication system - Technical
specifications for engineering
(English Translation)**

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1 Scope

This Standard specifies the requirements for the design, construction, and engineering acceptance of the Police Digital Trunking (PDT) communication system.

This Standard applies to the construction, reconstruction, and expansion of the Police Digital

Trunking (PDT) communication system.

2 Normative References

The following documents are essential to the application of this Document. For the dated documents, only the versions with the dates indicated are applicable to this Document; for the undated documents, only the latest version (including all the amendments) is applicable to this

Document.

GB 50174-2008 Code for Design of Electronic Information System Room

GB 50201-2014 Standard for flood control

GB 50348-2004 Technical code for engineering of security and protection system

GB 50689-2011 Code for design of lightning protection and earthing engineering for telecommunication bureaus (Stations)

GA/T 1056-2013 Police digital trunking communication system-General technical specifications

GA/T 1059-2013 Police digital trunking communication system-Security technical specifications

GA/T 1255-2016 Police digital trunking communication system Technical requirements and measurement methods for radio frequency equipment

GA/T 1367-2017 Police digital trunking communication system-measurement methods for function

GF 005-1994 Technical specification for interface for special mobile communication

--- Security docking platform completes the secure docking of the PDT system and the public security information network, including front-end servers, network gates, back- end servers, firewalls and other equipment to ensure the security of the public security information network and the PDT private network; and ensure to realize real-time interaction, complete functions and no missing of the security of the voice and data services of PDT private network and the public security information network;

--- Other supporting equipment such as database servers, network management servers, etc.

provide necessary support for the operation of the soft switch system;

--- The mobile switch office should consider hot backup for disaster recovery in different locations.

5.4.1 Overview

The transmission link mainly includes the following links: links between base stations and switching centers, links between switching centers, links between switching centers and management clients, scheduling clients, and monitoring clients.

When using the computer room provided by social resources and the link rented from the public network telecommunications operator, it shall not be directly connected to the public security information network.

5.4.2 Link form

The link shall use an IP dedicated link.

5.4.3 Link bandwidth requirements

IP links are used to connect switching centers.

The link bandwidth requirements between switching centers are 5Mbps~10Mbps.

The link bandwidth between base stations and switches is required to be no less than 64kbps per carrier.

5.4.4 Transmission links between dispatch desks and management terminals

The remote network management/dispatching terminal is connected to the main switching center using a link with a bandwidth of no less than 2Mbps.

5.4.5 Transmission links for monitoring terminals

On the basis of meeting the bandwidth of cluster services, the network bandwidth that supports monitoring video transmission shall be selected to avoid affecting cluster services.

5.4.6 Reliability requirements

Key transmission links should adopt a dual backup design.

Link requirements between base stations and switching centers: network delay is no more than

50 ms, network jitter is no more than 20 ms, and packet loss rate is no more than 1×10^{-3} .

Link requirements between switching centers: network delay is no more than 100ms, network jitter is no more than 50ms, and packet loss rate is no more than 1×10^{-3} .

5.5.1 Overview

Wireless network design shall include site coverage planning, capacity design and frequency configuration.

5.5.2.1 Principles of wireless network coverage design

In wireless network coverage design, the hanging height of antenna, antenna type, antenna azimuth and down-tilt angle of the base station shall be determined based on the principle of meeting the coverage range and reducing frequency interference.

5.5.2.2 Contents of wireless network coverage design

Wireless network coverage design shall include the following contents:

- Site location;
- Number of sites;
- Site type;
- Hanging height of antenna;
- Wireless parameters (including transmission power, antenna gain, tilt angle, directional pattern, antenna feed system loss, etc.);
- Coverage prediction.

In order to solve the problem of mismatch in uplink and downlink communication distance between the handset station and the base station, the following measures can be adopted:

- Base station adopts diversity reception;
- Base station receiving antenna uses high-gain directional antenna.
- g) Determine the specific site location through on-site survey;
- h) Adjust the initial site setting plan according to the actual site.

5.5.3.1 Contents of wireless network capacity design

The wireless network capacity design shall include the following:

- Calculate the number of voice channels based on the volume of single call and group call traffic;
- Calculate the number of data channels based on the amount of satellite positioning data;
- Consider 20%~30% redundancy.

5.5.3.2 Basic steps for wireless network capacity design

The design of digital trunking wireless capacity should follow the following basic steps:

- a) Clarify the user capacity demand target;
- b) Predict the traffic and data flow in the coverage area based on the traffic model;
- c) Predict the traffic and data flow absorbed by each base station;
- d) Determine the number of carriers configured for the base station based on the Irish formula.

5.5.4 Wireless network frequency configuration

The frequency configuration shall comply with the following basic principles:

- Use a frequency reuse method of no less than 12 groups;
- No third-order intermodulation and no adjacent channel interference within the station;
- The minimum channel frequency interval of the same combiner is no less than 250kHz;
- No adjacent channel interference between adjacent stations, and no co-channel interference between multiplexing stations;
- When frequency reuse is used, the co-channel suppression, adjacent channel selectivity and intermodulation response suppression indicators shall meet the requirements of

GA/T 1056-2013.