

ICS 33.200
CCS M 53



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 27604-2024

Replacing GB/T 27604-2011

Mobile emergency location service rule

移动应急位置服务规则

Issued on: May 28, 2024

Implemented on: September 1, 2024

**Issued by: State Administration for Market Regulation;
Standardization Administration of the PRC**

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1 Scope

The document establishes the rules for mobile emergency location service, covering the system architecture and the service requirements.

It applies to mobile emergency location service provided by communication operators and by location service providers. Other classes of mobile location service may follow it as a reference.

2 Normative references

Seven documents are cited: GB/T 30284-2020 on security technical requirements for the operating system of intelligent mobile communication terminals, GB/T 34976-2017 on security technical requirements and test and evaluation methods for the operating system of intelligent mobile terminals, GB/T 34977-2017 on data storage security for intelligent mobile terminals, GB/T 34978-2017 on personal information protection for intelligent mobile terminals, GB/T 35965.1-2018 on the emergency information exchange protocol for warning information, GB/T 39267-2020 on BeiDou navigation satellite system terminology,

and GB/T 41443-2022 on the geographic information emergency data specification.

The terms and definitions of GB/T 35965.1-2018 and GB/T 39267-2020 apply along with those given in Clause 3.

3 Terms and definitions

Mobile emergency location service, abbreviated MELS, is the process of obtaining the position information of a mobile terminal over a communication network by defined technical means, and of providing information based on time and spatial position to the mobile terminal and to the parties with an interest in it, among them the user of the terminal, rescue service organizations and insurance companies.

The emergency location service platform is the whole of the data, software and supporting environment through which emergency location information services and applications are carried out.

The emergency rescue and disposal platform is a technical system for emergency response to sudden events, built on public safety technology and information technology, organized around the emergency management process and combining hardware and software; it is the tool for carrying out an emergency plan. It provides information reporting and receipt, plan management, resource management, service support, forecasting and early warning, emergency disposal, emergency assessment, training and drills, and thematic applications; it generates optimized coordination and resource allocation schemes dynamically and forms a visual operating guide for carrying out an emergency plan. The definition is adapted from 3.6 of GB/T 35965.1-2018.

A rescue service organization is a service department or organization that provides rescue; a note lists public security, fire, medical and emergency management bodies.

Call response time is the interval from the moment a mobile communication terminal sends a call signal or message to the moment the emergency rescue and disposal platform receives and issues the position information of that terminal.

Location precision is a measure of the reproducibility of a set of position observations; a note states that precision is normally expressed as a statistic of a set of repeated observations, such as the standard deviation of the sample mean.

4 Abbreviated terms

Nineteen abbreviations are listed: A-GNSS assisted global navigation satellite system; AFLT advanced forward link trilateration; ALI automatic location information; ANI automatic number information; AOA angle of arrival; CGCS China geodetic coordinate system; EOTD enhanced observed time difference; ID identity; OTD observed time difference; POI points of interest; PT positioning technology; RF fingerprinting radio frequency fingerprinting;

RSTD reference signal time difference; RTT round trip time positioning; SLE SparkLink low energy; TDOA time difference of arrival; TOA time of arrival; and WGS world geodetic system.

5 System architecture

The overall architecture of the mobile emergency location service system is shown in Figure 1 and is built from the mobile terminal, the communication network, the emergency location service platform, the emergency rescue and disposal platform and the rescue service organizations.

The mobile terminal has communication and positioning functions and may also have location information service, display and interaction functions. Terminal types include, without being limited to, mobile phones, portable computers, wearable devices, airborne, shipborne and vehicle terminals, satellite communication terminals and Internet of Things terminals.

The communication network is the transmission channel for communication, positioning service, position information transfer and rescue operations between the mobile terminal and the emergency location service platform, the emergency rescue and disposal platform and the rescue organizations. Network types include, without being limited to, mobile and fixed communication networks, the Internet, private communication networks and satellite communication networks.

The emergency location service platform obtains the position information of the mobile terminal by satellite or non-satellite positioning, processes the location precision and the related information, and, on a request from the emergency rescue and disposal platform, passes the processed position information to it.

The emergency rescue and disposal platform answers requests from the mobile terminal and obtains position information through its link with the emergency location service platform. It may carry decision-making, command, dispatch and mobile disposal functions covering mobile terminals, points of interest, emergency personnel and material resources, routes for major events, evacuation routes and medical rescue facilities. The rescue service organizations carry out the rescue work on the instructions of that platform.

The service flow is shown in Figure 2 with steps lettered a to k. The mobile terminal obtains position information from a satellite or non-satellite positioning source. On raising an emergency rescue request it sends the call or distress message together with the position information over the communication network, that information being either the position fixed directly by the terminal or a high precision position after augmentation. The communication operator passes the call or distress message over the network to the emergency rescue and disposal platform, such as the numbers 110, 120 or 999. The location service provider obtains the position information over the network and obtains a more accurate position from

augmentation information. The emergency rescue and disposal platform sends the location service provider a request for position information and sends feedback to the mobile terminal. The location service provider passes the processed position information to the emergency rescue and disposal platform and then logs and stores the data. From the call or distress message and the processed position information, the emergency rescue and disposal platform shows the terminal position on an electronic map, dispatches the rescue service organization and gives notice of the rescue. The rescue service organization sends a rescue notice to the rescue personnel from the position information and its description, and the rescue personnel go to the scene guided by the electronic map.

6.1 Basic requirements for the service

Any implementation or product of the mobile emergency location service meets the requirements on service operation and information content laid down in the document.

The service platforms work together with one another and with their branch platforms in a clear hierarchy. Service functions work across platforms, are practical and simple, keep to real results and are improved continuously.

The service platform can extend and upgrade its interfaces in architecture, capacity, communication and processing power, and it safeguards equipment security and information security.

6.2 Basic information of the service

For automatic number information, the emergency location service platform, for instance that of the communication operator, identifies the calling subscriber number and sends it to the emergency rescue and disposal platform as the call-back number.

For automatic location information, the emergency location service platform determines the position of the calling subscriber and sends the positioning result, the positioning accuracy, the confidence of that accuracy, the valid data flag, the identifier of the positioning technology service provider and the positioning technology used to the emergency rescue and disposal platform, which uses this information to display the caller's telephone number, address or position and the related data.

Table 1 lists the fields of the automatic location information with their content: Longitude, the geodetic longitude or X coordinate; Latitude, the geodetic latitude or Y coordinate; Elevation, the geodetic height or Z coordinate; Location Valid Flag, the valid data flag where 1 means valid and 0 invalid; Datum, the reference coordinate system where 20 means CGCS2000 and 84 means WGS84; Location Precision, the location precision in metres; Confidence of Location, given as a percentage from 0 % to 100 %; PT Provider ID, the identifier of the positioning technology service provider; Codes of PT, the positioning technology used, coded from 0 to 16 as unknown; network without the technique stated;