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Vehicle emergency call system based on public telecommunication network - Requirements and architecture

基于公众电信网的车载紧急报警系统 需求及总体架构

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Table of Contents

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1 Scope

This Standard specifies the requirements and overall architecture of the vehicle emergency call system based on public telecommunication network (abbreviated as the system), including system architecture and requirements, application scenarios, business processes and data set requirements.

This Standard applies to the vehicle emergency call system based on public telecommunication network that are pre-installed or post-installed on vehicles sold and used in China.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

YD/T 3695-2020, *Technical requirements for wireless data transmission of car emergency alarm system based on public telecommunication network*

YD/T 3711-2020, *Vehicle-borne emergency alarm system based on public telecommunications network - Technical requirements for data transmission based on IMS*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1 vehicle emergency call

When the vehicle encounters an emergency, the emergency alarm call triggered by the on-board terminal.

3.2 public safety answering point

It is also called the emergency linkage command platform, which is a unified alarm

provided by the roaming area.

- System reliability: The system shall ensure high reliability through backup, disaster recovery, redundancy and other mechanisms.

6.2 Platform capability requirements

6.2.1 PSAP functional requirements

PSAP shall meet the following functional requirements:

- It has the functions of handling emergency calls, supporting queuing mechanism and automatic seat allocation;

- It shall have data statistics, analysis functions and data and information security strategies;

- It shall have data replication and off-site disaster recovery functions.

6.2.2 Functional requirements of vehicle emergency rescue platform

The vehicle emergency rescue platform shall meet the following functional requirements:

- It shall be able to handle emergency calls, support queuing mechanism, automatic seat allocation function, and multi-party calling function;

- It shall have the function of receiving and parsing emergency rescue data sets, supporting retransmission mechanism. The information types include voice, data, SMS, optional pictures and videos;

- It shall have resource integration function (PSAP database resources, map resources, etc.);

- It shall have complete service records and traceability functions;

- It shall have an information management system and information security strategy, including all vehicle-mounted emergency call related information such as the vehicle uploaded information received, user information and vehicle information stored on the platform;

- It shall have operational monitoring and management functions, including role management, authority management, log management, performance monitoring, alarm monitoring, etc.;

- It shall have functions such as data statistics, analysis and report export;

- It shall have data backup and off-site disaster recovery functions.

6.2.3 PSAP and vehicle emergency rescue platform performance requirements

PSAP and vehicle emergency rescue platform shall meet the following performance requirements:

- It shall support multiple voice channels concurrently;

- It shall support 7×24h operation;

- IT system availability requirements shall meet >99.99%;

- Service response speed requirements: The response rate within 12 s shall reach 95%, the response rate within 45 seconds shall reach 99%, and the response rate within 120 seconds shall reach 100%;

- The call loss rate shall be ≤1% (if the user hangs up the call, it will not be included in the call loss rate).

6.3 Terminal capability requirements

The terminal shall have the following functions:

- It shall have the ability to automatically trigger and manually trigger emergency alarms;

- It shall be able to collect location information and vehicle status information. It can also be able to collect video or pictures and other environmental perception capabilities;

- It shall have network connection and data transmission capabilities;

- It shall have the function of automatically making/answering calls;

- It shall have the function of whitelisting phone and SMS numbers;

- It shall have an automatic data retransmission mechanism and support platform data retransmission requests;

- It shall have self-checking capability. It can optionally provide fault information prompts through sound, indicator lights, etc.;

- It shall have the function of recording the vehicle emergency alarm log, providing an external reading interface;

- It shall support OTA upgrade of firmware and configuration.

4) The vehicle emergency rescue platform reports the rescue data set, relevant vehicle data and user data uploaded by the terminal to PSAP.

8.2 Abnormal business process

There are similar abnormal response processes for PSAP directly accepting alarms or vehicle emergency rescue platform accepting alarms. Abnormal processes include voice connection but no data upload (or incomplete data) and data transmission but no voice connection. The platform shall follow the following process.

When the voice is connected but no data is uploaded (or the data is incomplete), the platform shall request the vehicle terminal to retransmit the rescue data set. The number of repeated requests shall be at least 5 times. The last upload time shall be 10 minutes after the accident time. If the retransmission fails, it is determined that the communication module is damaged or out of the signal area. During the data retransmission period, the operator can understand the accident information based on the call situation. At the same time, the platform will provide the data uploaded by the vehicle terminal for the operator's reference as appropriate.

When there is data transmission but no voice connection, the platform shall request the vehicle terminal to re-initiate the voice call. The number of repeated requests shall be at least 5 times. The last voice request time shall be 10 minutes after the accident time. If the voice call fails, it is determined that the communication module is damaged or out of the signal area. During the voice retransmission period, the operator can make an outbound call to the bound user's mobile phone or emergency contact based on the rescue data set to try to establish a voice connection.

9 Data set requirements

The rescue data set of the vehicle emergency call system includes two parts: mandatory data set and optional data set. The mandatory data set includes the necessary data related to the accident vehicle for rescue services when rescue occurs, such as call information, vehicle information, accident information, etc. The optional data set includes data sets used to assist, improve and support rescue dispatch services. The vehicle emergency call system data set is generated and sent to the platform by the vehicle terminal. With the help of this data, the vehicle emergency rescue system can provide more targeted and effective rescue services.

For vehicle emergency call systems that use in-band transmission or IMS transmission, the required data sets can be found in YD/T 3695-2020 "Technical requirements for wireless data transmission of car emergency alarm system based on public telecommunication network", and minimum data set requirements in YD/T 3711-2020 "Vehicle-borne emergency alarm system based on public telecommunications network - Technical requirements for data transmission based on IMS".

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