E-Call (A Call between Life and Death)

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Abstract: *The European Union is promoting eCall to reduce the number of roadway fatalities by minimizing the response time when an accident has occurred. eCall is a combination of an In Vehicle System (IVS), a device with a GSM cell phone and GPS location capability, and a corresponding infrastructure of Public Safety Answering Points (PSAPs) Intelligent Vehicle Safety Systems use Information and Communications Technologies for providing solutions for improving road safety in particular in the pre-crash phase when the accident can still be avoided or at least its severity significantly reduced. With these systems, which can operate either autonomously on-board the vehicle, or be based on vehicle-to-vehicle or vehicle-to-infrastructure communication (co-operative systems), the number of accidents and their severity can be reduced. Location-enhanced emergency calls like in-vehicle e-call have their primary benefit to society of saving lives and in offering an increased sense of security. The article presents the system eCall and how does it works.*

Keywords: Global positioning system (GPS), public safety answering point (PSAP), Global System for Mobile Communication (GSM)

1. Introduction

According the European Commission (EC) there were approximately 39,000 deaths and more than 1.7 million people injured in Europe during 2008[1][2]. The evolution of the telematics sector and the introduction of e-Call have created an opportunity for deaths via vehicle accidents to be reduced. The eCall service has been introduced and fostered by the European Commission, with the aim to establish the fully operational service in 2015s

The pan-European in-vehicle emergency call, "eCall", is estimated to have the potential to save up to 2,500 fatalities annually in Europe when fully deployed[3][4]. Furthermore, it can reduce the severity of injuries, reduce human suffering and bring significant savings to society in terms of healthcare and other related costs.

Emergency calls made from vehicles or mobile telephones using wireless technology can assist in significantly reducing road deaths and injuries [5][6]. However, drivers often have inaccurate location details, especially on interurban roads or abroad. In many situations the car occupants may not be in a position to call using a normal mobile phone.

The objective of implementing the pan-European in-vehicle emergency call system (eCall) is to automate the notification of a traffic accident from anywhere in the European Union and associated countries, using the same technical standards [7]. This seminar gives an overview of the status of eCall and associated documents. It also discusses design considerations for the eCall in-vehicle system in order to reduce cost for vehicle manufacturers.

The following shows how the e-call system works. In the event of an accident, the on-board e-Call device transmits an emergency call to the most appropriate public service answering point (PSAP) along with certain vehicle-related data (notably the vehicle's precise location). The emergency call can be triggered either manually by the occupants of the vehicle or automatically, in the event of a serious accident, thanks to sensors installed in the vehicle
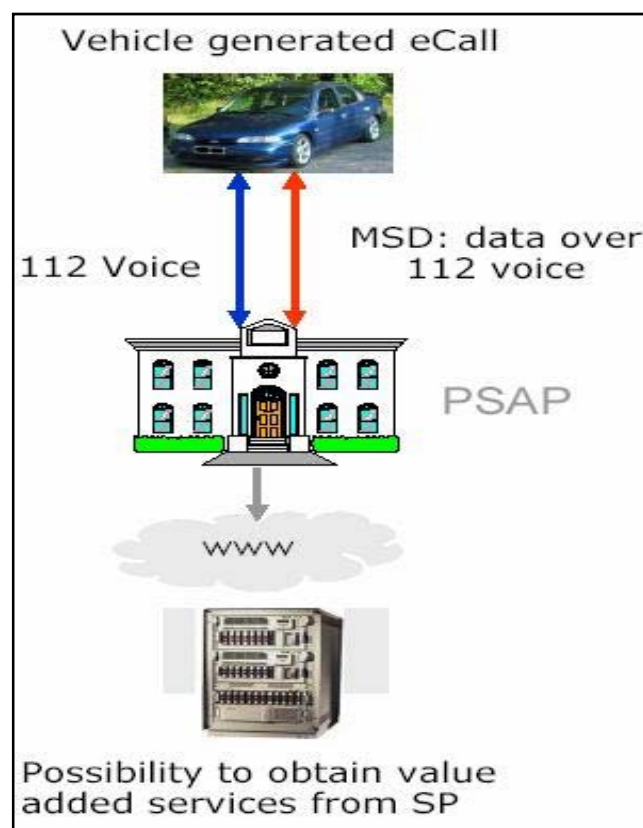

Figure 1: General block diagram of e-call

2. Technology

When a serious accident occurs, in-vehicle sensors will automatically trigger an eCall. When activated, the in-vehicle system (IVS) establishes a 112-voice connection. At the same time an emergency message, the minimum set of data (MSD) including key information about the accident, such as time, location, driving direction and vehicle description, is sent with the voice call. The eCall can also be activated manually. The mobile network operator (MNO) identifies that the 112 call is an eCall from the "eCall flag" inserted by the vehicle's communication module. The MNO handles the eCall like any other 112 call and routes the call

to the most appropriate emergency response center - Public Safety Answering Point (PSAP). The PSAP operator will receive both the voice call and the MSD. The below figure shows the e-call technology
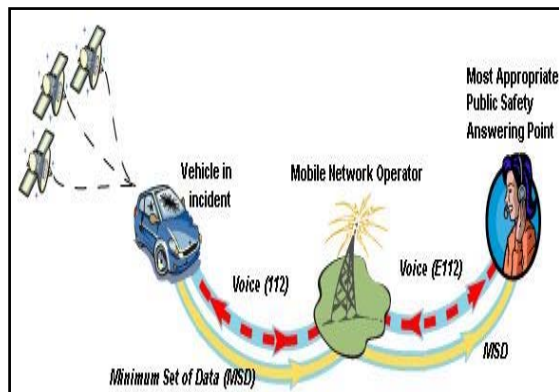

Figure 2: e-Call technology

The information provided by the MSD will be decoded and displayed in the PSAP operator screen. At the same time, the operator will be able to hear what is happening in the vehicle and talk with the occupants of the vehicle if possible. This will help the operator ascertain which emergency services are needed at the accident scene (ambulance, fire, police) and to rapidly dispatch the alert and all relevant information to the right service.

The MSD includes vehicle location information, time stamp, number passengers, vehicle identification number (VIN), and geographical locations along with other relevant information. SRC helps detecting the number of Bluetooth active handheld devices which provides the estimation of the number of people in the car. The other ways of finding the number of people can be seat belt sensors and also pressure on the seats can be used for the same.

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However in the pan European eCall operating requirements it is defined that:

• The solution is robust and will normally survive a crash
• The quality of service of the in-vehicle equipment, including communications equipment, is reliable.

3. Literature Review

eCall is seen as a priority safety system in Europe by the EU Commission mainly because of the great potential to reduce the number of road fatalities, which is a major societal problem in Europe. A Public Safety Answering Point (PSAP), sometimes called "Public Safety Access Point", is a call center responsible for answering calls to an emergency

telephone number for police, fire fighting and ambulance services (112 and locally derived numbers).

Imagine you had a serious accident and no one saw it or even worse: no one is there. What do you do if you are injured or trapped in the vehicle on a lightly travelled country road and need help? Then this technology will help you and save your life. In the event of an accident, these systems immediately transmit an emergency call to the local rescue service either manually or no manually (on its own). The communication says not only that something has happened but also how serious the accident is and gives the location of the vehicle involved in the accident.

4. Future

The European Commission has proposed two new proposals that would see installation of eCall technology, which can make automated emergency calls in the event of road accidents, mandatory in all new models of passenger cars and light duty vehicles from October 2015. Public "eCall" is the future pan-European in-vehicle emergency call system, expected to be operational beginning in 2015.

1. Will automatically trigger an emergency call for severe accidents.
2. Creates a voice link to the closest Public Safety Answering Point (PSAP) and
3. Sends an emergency message, including key information about the accident, such as time, accurate location, driving direction and vehicle description

Private Third Party emergency Call are proprietary value-add services (e.g., Volvo OnCall, GM OnStar, PSA, Fiat, BMW). These services are expected to continue to exist.

5. Conclusion

There by we conclude that this e-call technology is highly efficient and is going to play a predominant role in future emergency service system. But in practical perception the government must take the responsibility of implementing this technology and take all the measures to make the best use of this e-call and we can handle one of the serious concern of today's leap in the number of accidental deaths. The day is not far when each and every car or vehicle is equipped with the e-call devices and the passengers and drivers can be assured of a healthy drive and a pleasant ride.

Another conclusion is that if there should be a Pan-European eCall system, the vehicle manufactures or the network providers can't develop this themselves. It is very important to include the public authorities in this matter and the public body for this has to be the EU. Only here can a solution be pushed across all EU Member States. On June 19th, the European Parliament's Committees on the Internal Market (IMCO) and Transport (TRAN) adopted a resolution that all new cars sold after 2015 should be fitted with eCall devices. This resolution underlines the Parliament's priority for eCall deployment and urges the European Commission to finalize outstanding legislation so as to meet the planned 2015 launch.

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