D6.3 Needs for eCall Certification,

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<td>CAN</td>
<td>Controller Area Network</td>
</tr>
<tr>
<td>CEN</td>
<td>Comité Européen de Normalisation</td>
</tr>
<tr>
<td>CIP</td>
<td>Competitiveness and Innovation Framework Programme</td>
</tr>
<tr>
<td>DoW</td>
<td>Description of Work</td>
</tr>
<tr>
<td>EC</td>
<td>European Commission</td>
</tr>
<tr>
<td>EGNOS</td>
<td>European Geostationary Navigation Overlay System</td>
</tr>
<tr>
<td>ENT</td>
<td>Ericsson Nikola Tesla</td>
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<td>ETSI</td>
<td>European Telecommunication Standards Institute</td>
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<td>EUCARIS</td>
<td>EUropean CAR and driving License Information System</td>
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<td>GDOP</td>
<td>Geometric dilution of precision</td>
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<td>GIS</td>
<td>Geographic Information System</td>
</tr>
<tr>
<td>GNSS</td>
<td>Global Navigation Satellite System</td>
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<tr>
<td>GPS</td>
<td>Global Positioning System</td>
</tr>
<tr>
<td>GPRS</td>
<td>General Packet Radio System</td>
</tr>
<tr>
<td>GSM</td>
<td>Global System of Mobile telecommunications</td>
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<tr>
<td>ISO</td>
<td>International Standardization Organization</td>
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<td>IVS</td>
<td>In-Vehicle System</td>
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<tr>
<td>KPI</td>
<td>Key Performance Indicator</td>
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<tr>
<td>MNO</td>
<td>Mobile Network Operator</td>
</tr>
<tr>
<td>MSD</td>
<td>Minimum Set of Data</td>
</tr>
<tr>
<td>PLMN</td>
<td>Public Land Mobile Network</td>
</tr>
<tr>
<td>PSAP</td>
<td>Public Service Answering Point</td>
</tr>
<tr>
<td>SIM</td>
<td>Subscriber Identity Module</td>
</tr>
<tr>
<td>SUT</td>
<td>System Under Test</td>
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<tr>
<td>TPS</td>
<td>Third Party Service</td>
</tr>
<tr>
<td>TMC</td>
<td>Traffic Management Centre</td>
</tr>
<tr>
<td>UMTS</td>
<td>Universal Mobile Telecommunication System</td>
</tr>
<tr>
<td>USB</td>
<td>Universal Serial Bus</td>
</tr>
<tr>
<td>VAS</td>
<td>Value Added Services</td>
</tr>
<tr>
<td>VIN</td>
<td>Vehicle Identification Number</td>
</tr>
<tr>
<td>VPN</td>
<td>Virtual Private Network</td>
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**Term**

**Definition**

ISO 9001: Quality management systems, requirements – Gives standard requirements for products to fulfill the quality and customer requirements.

The following definitions are reported from Directive 2007/46/EC (Article 3):

**EC type-approval**

The procedure whereby a Member State certifies that a type of vehicle, system, component or separate technical unit satisfies the relevant administrative provisions and technical requirements of Directive 2007/46/EC and of the regulatory acts. (Directive 2007/46/EC)
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<th>Term</th>
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<td>Individual approval</td>
<td>The procedure whereby a Member State certifies that a particular vehicle, whether unique or not, satisfies the relevant administrative provisions and technical requirements. (Directive 2007/46/EC)</td>
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<td>IVS</td>
<td>In-vehicle equipment together with the means to trigger, manage and effect the eCall transaction.</td>
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<tr>
<td>Mixed type-approval</td>
<td>A step-by-step type-approval procedure for which one or more system approvals are achieved during the final stage of the approval of the whole vehicle, without it being necessary to issue the EC type-approval certificates for those systems. (Directive 2007/46/EC)</td>
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<tr>
<td>Multi-stage type-app</td>
<td>The procedure whereby one or more Member States certify that, depending on the state of completion, an incomplete or completed type of vehicle satisfies the relevant administrative provisions and technical requirements of Directive 2007/46/EC. (Directive 2007/46/EC)</td>
</tr>
<tr>
<td>National type-approval</td>
<td>A type-approval procedure laid down by the national law of a Member State, the validity of such approval being restricted to the territory of that Member State. (Directive 2007/46/EC)</td>
</tr>
<tr>
<td>Process</td>
<td>The method of operation in any particular stage of development of the material part, component or assembly involved.</td>
</tr>
<tr>
<td>PSAP</td>
<td>Physical location working on behalf of the national authorities where emergency calls are first received under the responsibility of a public authority or a private organization recognized by the national government.</td>
</tr>
<tr>
<td>Step-by-step type-app</td>
<td>means a vehicle approval procedure consisting in the step-by-step collection of the whole set of EC type-approval certificates for the systems, components and separate technical units relating to the vehicle, and which leads, at the final stage, to the approval of the whole vehicle. (Directive 2007/46/EC)</td>
</tr>
<tr>
<td>Type-approval</td>
<td>The procedure whereby a Member State certifies that a type of vehicle, system, component or separate technical unit satisfies the relevant administrative provisions and technical requirements. (Directive 2007/46/EC)</td>
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2 Executive summary

The Deliverable D6.3 provides a preliminary consideration on certification needs for eCall taking into account the HeERO partners’ knowledge in certification collected by using specific questionnaires which highlight their needs and experiences.

112 eCall system needs to work at European level (in all EU Member States). Each Member State has its own deployment, each single IVS needs to work in every country and all MNOs and designated PSAPs need to be capable of properly handling 112 eCall and the minimum set of data (MSD): in this context, certification (or other methods) is needed to achieve this end-to-end interoperability.

The content of this Deliverable is mainly based on specific questionnaires reported in Appendix and proposed to all HeERO partners, to Member States and, specifically, to car manufacturers: a list of more general questions on eCall Certification and specific questions related to the In-Vehicle System (IVS), Public Safety Answering Point (PSAP) and Mobile Network Operator (MNO), as detailed in Chapter 6, have been used.

D6.3 is mainly structured in the following Chapters:

1) An overview on eCall Specification (Chapter 4).

2) General consideration on eCall needs for Certification derived from the answer to the questionnaire (Chapter 5).

3) A detailed description of the proposed questionnaires (Chapter 6).

The aim of D6.3 is to provide a preliminary consideration on needs for certification taking into account the feedback from different stakeholders involved in eCall Deployment: considering the answers of the questionnaire all the organizations understand the certification almost in a similar way they consider certification an important part of the pan-European eCall system.

The material of this Deliverable is to be considered as an input for the on-going activity of standardization Task Force in HeERO and HeERO2 which will provide a more detailed contribution for the procedures for eCall certification.
3 Introduction

3.1 Purpose of Document

The Deliverable D6.3 provides a preliminary consideration on certification needs for eCall taking into account a report of the HeERO consortium partners’ knowledge in certification collected by using specific questionnaires which highlight their experiences and needs.

It should be stressed that this is an interim report which will be reflected in the Description of Work for HeERO 1 and a more comprehensive and embracing deliverable will be issued through HeERO 2. This is due to the experience regarding eCall and certification evolving during the life of the HeERO 1 project. The nature of the subject is such that the full recommendations will not be available until the later part of 2014 which will be outside of the timeline for HeERO 1 for this reason this deliverable is in the format as shown.

The 112 eCall system needs to work at Pan-European level (in all EU Member States). Each Member State has its own deployment profile, each single IVS needs to work in every country and all MNOs and designated PSAPs need to be capable of correctly handling the 112 eCall and receiving and decoding the minimum set of data (MSD): in this context, certification (or other methods) is required to achieve this end-to-end interoperability.

To provide an answer to the needs of certification the activity has been carried out in HeERO WP6 partners as follows:

- Specific questionnaires have been elaborated (as illustrated in Chapter 6).
- The questionnaires have been submitted to the partners and their answers have been collected (see Appendix).
- Some general preliminary considerations have been proposed (Chapter 5).

Special consideration and focus is devoted to the problems of the car industry and retrofitting industry based on the received reports. The results cover both needs for certification and the possible problems identified related to the barriers and enablers of eCall deployment.

This document is not intended to provide a detailed description of the steps for the eCall certification. Further activities will be carried out in HeERO CIP projects 1 and 2 (and in the HeERO standardization Task Force, which has a specific remit to look at these and linked issues) to study the certification and to provide a suitable certification framework for eCall.
3.2 Structure of Document

This document is based on HeERO-project document template. The deliverable specific parts start from chapter 4. First there is general information eCall operating principles and general standard, aiming to detail the current situation of the pan-European harmonized 112 eCall system.

Next there are different experiences about certification from partners.

Information is gathered from WP6 member participants by questionnaires. Questionnaires are also sent to carefully selected parties such as the automotive industry representatives. Also other earlier HeERO-project material is used, especially HeERO deliverable 6.1 “eCall deployment barriers and enablers preliminary report” and documents from WP2 are considered as sources. Also external sources are used. All the sources used are listed in sources on correct format.
D6.3 Needs for eCall Certification

In Chapter 5, some considerations on the needs for certification are illustrated, while Chapter 6 provides a synthetic illustration of the provided questionnaires.

At the end of the document there are Appendix 1, 2 and 3. They include the original questionnaires: all the answers are gathered under the questions. The answers are in the same form as they have been received: no modifications have been performed.

3.3 HeERO Contractual References

HeERO is a Pilot type A of the ICT Policy Support Programme (ICT PSP), Competitiveness and Innovation Framework Programme (CIP). It stands for Harmonized eCall European Pilot.

The Grant Agreement number is 270906 and project duration is 36 months, effective from 01 January 2011 until 31 December 2013. It is a contract with the European Commission, DG CONNECT.

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4 Overview on eCall: operating principle and relevant standards

Certification is predominately based on requirements from the published standards for eCall. A standard may be a proprietary one, developed by one entity, an industry standard agreed by mayor representative within a specific industry or open standards. Internationally mayor standardization bodies are ITU, ISO or on European level ETSI and CEN/CENELEC.

Additional requirements might have to be considered e.g. system performance. In this Chapter which includes an overview of the eCall operating principle and related standards is presented.

4.1 eCall operating principle

The eCall basic operating principles are defined in the European Standard EN 16072. The generic eCall functional operational sequence is as follows:

a) The eCall generator initiates the eCall by sensors triggered and/or manually, then it sends the in-vehicle triggered eCall to a PSAP. The eCall consists of two elements:

1) The minimum set of data (MSD), and

2) A voice (audio) telephone call based on TS12 (112)

b) The eCall, is carried through the wireless communications network, and is recognized by the wireless communications network operator (MNO) system as a TS12 (112) emergency call. An eCall compliant MNO system will make use of the eCall flag, as specified in ETSI TS 124 008 [Release 8 or later], which is received in the emergency call set-up message, to differentiate eCalls from other TS12 emergency calls, as the call specifically contains data in the voice channel. As a consequence the eCall flag may be used to filter and route eCalls to a dedicated destination within a PSAP if required.

c) The MNO are required to treat the eCall as any other TS12 emergency call. An eCall-equipped vehicle should be capable of making an emergency call to any available Public Land Mobile Network (PLMN) that supports 112 and/or E112 emergency calls. Since some
European authorities require a SIM to be present in mobile terminals when making an emergency call, it is likely that a SIM card will be included in the IVS for this purpose.

d) The wireless communications network operator (MNO) system shall establish the TS12 call and route the voice call, including the MSD, to the most appropriate PSAP, according to national arrangements.

e) The PSAP transmits an acknowledgement to the eCall IVS specifying that the MSD has been properly received. The details of how this is achieved, and consequent responses, are determined in EN 16062.

f) The voice (audio) link is established.

![Figure 2: eCall basic operating principle (EN 16062)](image)

The operating principle is well prepared and the 112 Pan-European eCall is feasible.

Most of the relevant standards have been adopted concerning eCall system. Currently a more detailed framework on how the certification process should be organized (e.g. voluntary or mandatory) is required.

4.2 In-Vehicle System (IVS) specific descriptions

The Pan-European eCall In-Vehicle System (IVS) can be divided in four different parts: Electronic Control Unit (ECU), external components like antenna and interfaces to the vehicle, communication system and Human-Machine Interaction (HMI). There are functional requirements concerning the IVS. These high level functional requirements are next listed as in European Standard EN 16072:
D6.3 Needs for eCall Certification

- The In-Vehicle System shall include a network access device (NAD, e.g. PLMN (such as GSM (2G) AND 3G), modules).

- The In-Vehicle System shall detect when an 'eCall trigger' has been initiated.

- In the event of an incident the eCall system will automatically determine whether or not to trigger an eCall and where appropriate make such an eCall automatically.

- An eCall may also be triggered manually, in the event of a vehicle occupant either seeing an event where assistance is required or the occupant requires assistance themselves in an event where the predetermined automatic triggers for eCall have not activated e.g. medical emergency.

- Upon triggering an eCall the eCall system will:
  - Establish a network connection to the strongest PLMN network available
  - The eCall system will establish a voice connection between the vehicle and that pre-assigned destination address (preferably a 'Public Safety Answering Point' (PSAP) with TS12).
  - Then send a Minimum Set of Data (MSD) to any system operated by a given mobile network operator (MNO) with the European pre-assigned TS12 destination address (112).

Also the IVS shall support at least one wireless medium and meets the specification of the operating requirements defined in ETSI TS 122 101, ETSI TS 124 008, ETSI TS 126 267, ETSI TS 126 268, ETSI TS 126 269. Also the IVS shall support eCall flag as specified in ETSI TS 124 008 (EN 16072).

Standards do not provide performance requirements for IVS. Standards are mainly specifying conformance requirements. For example network accesses and triggering the eCall are functional performance requirements which might be added.

In the standard EN 16072 it is stated separately that the IVS is needed to be eCall compatible and the IVS needs to be robust and normally survive a crash. Also it is written that the automotive manufacturer or equipment supplier shall make best reasonable effort to enable an audio channel to be established so long as the relevant equipment has not been disabled in the crash.

The eCall service shall only operate from the point of service demand (automatic or manual triggering of the eCall). That is the reason why eCall is a dormant application and shall not be
available unless specifically triggered for its specific use i.e. at the point of eCall message triggering as defined in EN16062.

4.2.1 HMI

The standard 16072 defines also IVS HMI aspects. First the IVS shall provide visual and audio information to inform in the status of the connection IVS-MNO-PSAP. The “IVS” means that there is no connection from the IVS to outside. The “MNO” means that the connection is made between IVS and MNO. The last “PSAP” means that the connection is made between IVS and PSAP consequently the connection is now accomplished. The HMI of the IVS might also give the information if it is not working properly.

![IVS HMI example](image)

Figure 3: Example of the IVS HMI manufactured by Guidepoint, although product does not include all required functionalities (Guidepoint systems)

The standard 16072 also states that IVS needs to be designed to prevent false calls. The triggering needs to be simple but the eCall manual triggering button needs to be designed so that it should be difficult to press it accidentally. The IVS needs to be designed to alert
vehicle occupants about sending the eCall message. In the standard there are no regulations concerning what form the alert should be.

The above mentioned issues show that there are also requirements to be detailed regarding the IVS human-machine interface since a lot of things are left to manufacturer’s responsibility. In Figure 4 a specific version of IVS is shown: it looks simple and easy to use. The purpose of the HMI is to allow manual initiation of eCall and provide eventually status information, however again note that there is no standardisation regarding the look location feel or activation method for the manual eCall button.

### 4.2.2 Data

At the discretion of the vehicle manufacturer/equipment supplier, optional additional data may also be provided by the IVS to the PSAP. The format of such data concepts shall be defined and the data concept shall be elaborated as determined in Standard EN 15722.

NOTE 1: EN 16072 states that, it is of course necessary for the PSAP to be able to immediately understand the meaning and limitations of any optional additional data provided. Registering the data concept with a freely available ITS emergency data registry maintained in accordance with EN ISO 24978 means that PSAPS are able to freely download such registry data to a local database on a regular and probably automatic basis so that local software can provide an immediate human readable interpretation of the meaning and limitations of the data content when an incident occurs.

NOTE 2: the provision of additional data over and above the options offered in the MSD (EN 15722) may be possible in some circumstances. However, it is recommended that for consistency and interoperability the format of all such data is made freely available in a data registry maintained in accordance with EN ISO 24978.

NOTE 3: registration of such data content by vehicle manufacturers in a data registry maintained in accordance with EN ISO 24978 enables them to quickly make such information available to PSAPs, for example when a new model or model upgrade is launched, without the need to harmonize the data concept with competitors, and without the need to work through the necessarily slow process of standardization, and to provide updated and further data content. It also enables different data contents for different models and different model years, yet retaining immediate comprehension by PSAPs.

The automatically triggered eCall may be set into one of two modes:

a) Automatically enabled on vehicle ignition-on.
D6.3 Needs for eCall Certification

b) Permanently disabled at the request of the vehicle owner by maintenance personnel and processes approved by the equipment supplier.

The normal mode of automatic operation shall be that the eCall system automatically enables an automatically triggered eCall on vehicle ignition-on.

In EN 16072 is reported:

- The In-Vehicle System shall provide clear visual and/or audible information regarding the status of the connection (IVS-MNO-PSAP) when the eCall system is automatically or manually activated.

- Subsequent to the triggering of the event, whether initiated automatically or manually, the In-Vehicle System shall wherever possible alert the vehicle occupants that an eCall message has been sent and that the system shall attempt to make a direct voice connection with the PSAP.

- The means by which this alert is made, and the nature of the alerts, shall be a function of product design and it is not defined in this European Standard.

EXAMPLE 1: a signal generated by the airbag control module and/or a combination of other sensor data (e.g. gyro, radar, axle load, speed), or other crash information status (a severe incident has happened), e.g. created in the airbag control module without deployment of an airbag (e.g. rear crash).

Without specifying the means of achievement, the following general requirements shall be met:

- The automatic eCall system shall be armed when ignition is ON and disarmed when ignition is OFF.

- If an eCall is ongoing while ignition is being switched to OFF, the call shall not be terminated automatically. The system shall disarm only after the eCall has been terminated.

- The automatic eCall trigger signal is generated by in-vehicle equipment to identify a probable collision. The nature of this device and its operational process shall be at the discretion of the vehicle manufacturer/equipment supplier.

EXAMPLE 2: a trigger generator may be the airbag control module and/or a combination of other sensor data (e.g. gyro, radar, axle load, speed):
The eCall shall be generated to reflect as many different crash types as possible (e.g. front, rear, side crashes). The automatic eCall trigger shall be safe, robust, reliable, and designed to maximise the number of valid eCalls whilst minimising the number of false eCalls, generated by the eCall generator.

### 4.2.3 Manual eCall triggering strategy

In EN 16072 is detailed:

- The availability of the manual triggered eCall with ignition off shall be at the discretion of the vehicle manufacturer/eCall in-vehicle equipment provider.

- Initiation of an eCall trigger signal shall be at the determination of an occupant of the vehicle, in accordance with the equipment provisions provided by vehicle manufacturer/equipment supplier.

- The vehicle manufacturer/equipment supplier shall design and implement reasonable precautions to avoid accidental manual triggering by the eCall generator. No specific requirements are determined within this European Standard.

### 4.2.4 Manual termination of eCall by vehicle occupants before trigger confirmation

In EN 16072 is detailed:

- The IVS may allow vehicle occupants to abandon a manually initiated eCall (in order to cancel an unwanted triggering) before the eCall has been activated, but once the eCall trigger has been confirmed within the IVS and therefore the eCall has been activated, the eCall transaction shall not be terminated by the vehicle occupants.

- In the case of an automatic eCall, it shall not be possible for the eCall transaction to be terminated by the vehicle occupants.

### 4.2.5 Termination of an in progress eCall

An in-progress eCall shall not be interrupted by the IVS and shall be terminated only by the PSAP. In the event of the call being interrupted, the IVS shall try to re-establish the connection. The means by which this is achieved shall be in accordance EN 16062:

- The IVS shall register recent eCalls in non-volatile memory. The method and means by which this is done, and number of records stored is not specified in this Standard.
Vehicle manufacturers and equipment suppliers shall be responsible for the certification of the eCall generator using recognised certification procedures.

NOTE: The end-to-end conformance tests for eCall are specified by CEN in TS 16454.

4.2.6 Self-test

In EN16072 is detailed:

- On power up the IVS shall normally perform a self-test without attempting to connect to the network. In the event of a critical system failure which would result in an inability to execute an eCall as described in this standard detected during or following the self-test, a warning shall be given to the occupants of the vehicle. The nature of such warning is a feature of product design and is not standardised in this document. It is then the responsibility of the driver/occupant(s) of the vehicle to consider whether the warning is to be followed up. Correct eCall functionality cannot be ensured as long such a critical system failure is present.

4.2.7 Standby mode applicable to IVS configured for eCall only.

In EN 16072 is detailed:

- Following the power-up, an IVS configured for 'eCall only' shall not attempt to register on a PLMN except as permitted in Clauses 7.1.3 and 7.2.2. The IVS shall go to standby mode and adopt the eCall 'Inactive State' in accordance with the eCall terminal state machine procedures specified in ETSI TS 124 008. An IVS configured for 'eCall only' shall periodically scan and maintain a list of available PLMNs, whilst in inactive state, so as to reduce the network selection and registration time in accordance with ETSI TS 122 011 when the IVS needs to initiate an eCall.

4.3 Mobile Network Operator (MNO) specific descriptions

In EN 16072 is detailed:

- The transport protocol across the wireless communications interface(s) that support the provision of eCall shall be in accordance with EN 16062.
Concerning performance requirements - time required to transmit data:

- Assuming the availability of a suitable wireless communications network, the transmission of the mandatory elements of the MSD (as defined in EN 15722) shall typically be completed within approximately four seconds, measured from the time when end-to-end connection with the PSAP is established and the synchronization of the in-band modem is completed. The in-band technology is defined by ETSI but not in the responsibility of the in-vehicle equipment provider. Certification and quality assurance of this requirement shall be specified in ETSI communications standards for media used for eCall (ETSI TS 122 101, ETSI TS 124 008, ETSI TS 126 267, ETSI TS 126 268, ETSI TS 126 269 [Release 8 or later]).

- Overall quality of service for the transmission aspects of an eCall shall be equal to (or better than) "mobile telephony service" as determined by ETSI/3GPP.

- NOTE 1: Shortening the time for response is crucial to achieve high quality processing and response to emergency messages.

- NOTE 2: In a wide range of geographical, physical and operational environments, minimum service requirement end-to-end timing requirements are difficult to prescribe. This European Standard does not make such requirement in order to claim compliance.

- The MNO shall ensure that the MSD transmission sequence including the acknowledgements using the ETSI in-band modem is robust and reliable across the network.

4.3.1 Acknowledgement of eCall

The following elements have to be noted:

- The system that receives the MSD data packet directly from the in-vehicle equipment shall transmit an acknowledgement to the eCall Generator specifying that the MSD has been properly received as defined in EN 15722 and EN 16062.

- NOTE: The transport layer protocol as defined in ETSI TS 122 101, ETSI TS 124 008, ETSI TS 126 267, ETSI TS 126 268, ETSI TS 126 269 [Release 8 or later] manages retransmission in the transport layer.
• In the event that the transport layer is unsuccessful in its attempts to send the MSD the transport layer shall advise the application layer and subsequent actions shall be as determined in EN 16062.

4.4 Public Service Answering Point (PSAP) specific descriptions

Individuals PSAPs may require that the network providers (MNOs) need to route eCalls to different connection than normal 112 emergency calls. If a single PSAP handles both eCalls and 112 calls and the PSAP uses the Euro ISDN primary rate interface (E1) for 112, network provider needs to ensure, that the eCalls are always routed to selected E1 channels, if this is required by individual PSAPs (EN 16072).

Automatically or manually triggered 112 eCall, will normally be given the highest priority on the use of whatever wireless networks are used by the In-Vehicle System for an eCall transaction, except where these are required for time-critical active safety messages. (EN 16072) This is about the eCall prioritizing which gives it same priorities as normal 112 emergency calls.

PSAP shall take appropriate measures and activate emergency response to a received MSD from an automatic eCall even if a two-way audio channel cannot be established with the occupants of the vehicle (EN 16072). This is very important, because one main purpose of the eCall is to ensure emergency service even if injured person is unconscious and cannot call it himself.

High priority, mentioned before, loose its effectiveness if there is not enough resources targeted to handle eCalls in PSAPs. Depending on the PSAP, eCalls cannot be handled in all the workstations. It is needed to plan carefully and be prepared to add more eCall capable workstations. This is one important point: what PSAPs need to do to maintain the eCall prioritizing and fast response time. Where PSAPs support a Pan-European eCall service they shall support eCall (EN 16072).

4.5 Data transfer

Concerning Data Transfer the following points have to be noted:

• Interfaces for both the message sending software (eCall client simulator) and receiving software (eCall test bed) will be implemented.
D6.3 Needs for eCall Certification

- Works seamlessly across multiple carriers with no impact to roaming agreements – No interoperability issues.
- Instantaneous transmission of MSD using established voice channel.
- Full-Duplex & Acknowledged delivery of MSD to PSAP.
- Fast and Reliable transmission of MSD.
- Supports switching between voice and data modes.
- Leverages existing carrier infrastructure without upgrades or re-provisioning.
- Flexible and scalable server architecture supporting centralized and distributed network implementations.
4.5.1 eCall Flag

In EN 16072 is detailed:

- NOTE: The purpose of the eCall 'Flag' is to enable a serving 'Mobile Switching Centre' (MSC), that supports this functionality, to differentiate between speeches only 'Teleservice 12 (TS12) emergency calls e.g.112 / E112, and eCalls.
- Additionally, when supported by the mobile network, the MSC may also be able to discriminate between manually Initiated eCalls and automatically Initiated eCalls.
- An in-vehicle system, or other user equipment designed to support eCall functionality, shall include in the emergency call set-up information that the present call is either a 'Manually Initiated eCall' (MIeC) or an 'Automatically Initiated eCall' (AIeC).
- This indication is provided by the „eCall flag” as specified in ETSI TS 124 008 [Release 8 or later].
- PLMNs shall make use of the eCall flag, received in the emergency call set-up, to differentiate eCalls from other TS12 emergency calls.
- The eCall flag may also be used to route eCalls to a dedicated PSAP operator.

4.5.2 MSD

In EN 16072 is detailed:

- NOTE: it may be noted that although an indication of manual or automatic eCall initiation is included in the MSD, this information is not used by the mobile network for routing eCalls to a particular PSAP, but may be used by the receiving PSAP.
- The format of the location data in the MSD shall be as defined in EN 15722.
- In the event that at the time of the MSD generation there is inadequate sources of information to provide a reliable determination of location the confidence bit shall be set to "no confidence in position" as determined in EN 15722. In this event the location data element shall contain the manufacturer/equipment supplier best estimation based on available information.
- NOTE: this may be, for example, the last location obtained where there was adequate data source available or a calculation based on that data and other information made available to the MSD calculation, for example a dead-reckoning.
- The confidence bit shall be set as determined in EN 15722. This flag should only be cleared to "position can be trusted" if a 2D or 3D position fix from current GNSS
reception is available or the manufacturer/equipment supplier has another means of being confident that the information provided is within the limit set by EN 15722.

- NOTE: in the event that the flag is set to "no confidence in position" this does not mean that the information is necessarily wrong, only that it may be unreliable or lack precision.

- A second source of location of the affected vehicle shall be provided by compliance of MNOs to Universal Service Directive (the so-called E112), by which they are already required to provide the location of the call (not of the vehicle).

- The MNO system calculated location shall be provided according to the Universal Service Directive 2002/22/EC to the PSAP who has been determined as the appropriate recipient according to local specification.

- If the MSD location is available and confirmed by the confident bit contained in the MSD as provided by the IVS, the MSD location can be taken in account by the PSAP. If the MSD location is not available or not confirmed by the confidence bit, the MNO system location may be taken in account if available from the network. Resolution of the situation shall be determined at a National level.

- NOTE: this is information obtained from the network and is in addition to the vehicle calculation of location that is included in the MSD. The accuracy of this data will depend on the physical properties of the network carrying the eCall message (a 3G calculated location will usually be more accurate than a 2G location, whereas a mobile wireless broadband calculation may be less accurate than either). Calculation accuracy is strongly related to the density of base stations, which is a function of the technology design, although other factors affect the accuracy. (see note to 7.2.2 above)

- NOTE: the purpose of providing the direction is to help PSAPs to determine the carriageway vehicle was using at the moment of the incident. GNSS provided direction only may not be sufficient to determine vehicle heading.

- It is either possible to make a request by VIN, or to make a request by license plate number + country code. The decision what type of request to make, is made by the actor. The request by VIN can be a Multi Country Inquiry or a request to a specific country.
4.6 General

In EN 16072 is detailed:

- Specific conformance requirements shall be the subject of specific aspects of eCall service provision and shall be developed by appropriate Standards Development Organisations for that subject area.

- Test and conformance requirements for public wireless network equipment and service shall be defined by reference to the relevant Standard(s) for that wireless network (ETSI TS 122 101, ETSI TS 124 008, ETSI TS 126 267, ETSI TS 126 268, ETSI TS 126 269 [Release 8 or later]).

- Any test and conformance requirements regarding the sequence of operations to affect the eCall are defined in EN 16062. Any test and conformance requirements regarding the MSD are defined in EN 15722.


- If technology evolution means that the initial communication equipment provided in the vehicle will no longer be operational, it is required that adequate notice is provided and that where necessary a viable migration path is provided. Network operators, vehicle manufacturers, equipment manufacturers, technology providers and regulators are relevant for this process. See also EN 16062.

eCall is the first of the major new applications to flow from the eSafety initiative: the experience with eCall indicates that the EC needs to ensure that it utilises its right of initiative to spur positive developments in the automotive sector. For “cars21” this is particularly relevant as an application for ITS within the intelligent car initiative: it is important to aid the contribution that the automotive sector gives to the Lisbon goals of a knowledge based competitive economy. Additional information is available at the following link:
4.6.1 Privacy

Privacy and data ownership and use rules, which are complex and vary by country, must be addressed before implementation of ITS safety messages.

Data contents submitted to the data registry are, in their design, free of any specific values and therefore are free of personal data; for this reason, the data registry should be free of privacy issues. However, in the instantiation of eSafety data in operational systems using these data concepts, the assigned values may, in some cases, carry personal data. Local regulation will determine which data can be transmitted, what has to be encrypted and which privacy protection is provided.

4.7 List of current standards and directives

Above are listed standards and directives which are related to the Pan-European 112 eCall system. There may be other related standards and decrees, but in this there is supposed to be those which have direct impact on 112 eCall.

Directive, 2007/46/EC

Directive, 2009/40/EY

Directive, 2010/40/EU

EN 16062; Intelligent transport systems — eSafety — eCall high level application requirements (HLAP)

EN 15722; Intelligent transport systems — eSafety — 'eCall' minimum set of data

EN ISO 24978; Intelligent transport systems — ITS Safety and emergency messages using any available wireless media — Data registry procedures

EN 16072; Intelligent transport systems — eSafety — Pan European eCall operating requirements

pr EN 16102; Intelligent transport systems, eSafety, Third party support for eCall – Operating requirements

CEN TS 16454:2012

ETSI TS 122 101; TSG Services and system aspects: service aspects; service principles (Release 8)

ETSI TS 124 008; TSG core network and terminals: mobile radio interface layer 3 specification; core network protocols; stage 3 [Release 8 or later]
ETSI TS 126 267; TSG services and system aspects; eCall data transfer – in-band modem solution; general description [Release 8 or later]

ETSI TS 126 268; eCall data transfer – in-band modem solution; ANSI-C reference code [Release 8 or later]

ETSI TS 126 269; eCall data transfer – in-band modem solution; conformance testing [Release 8 or later]

ETSI TS 122 003; Digital cellular communications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Circuit Teleservices supported by a Public Land Mobile Network (PLMN). (Teleservice 12/TC12) /E12) [Release 8 or later]

ETSI TS 122 011; Digital cellular telecommunications system (phase 2+); Universal mobile telecommunications system (UMTS); LTE; Service accessibility [Release 8 or later]

ETSI TS 127 007; Digital cellular telecommunications system (phase 2+); Universal mobile telecommunications system (UMTS); AT command set for user equipment [Release 8 or later]

ETSI TS 102 164; Telecommunications and internet converged services and protocols for advanced networking (TISPAN); Emergency location protocols [version 1.3.1]

ETSI TS 124 123; Universal Mobile Telecommunications System (UMTS); User Equipment (UE) conformance specification; Part 1: Protocol conformance specification (3GPP TS 34.123-1 version 8.6.0 [Release 8 or later]

ETSI TS 121 133; Universal Mobile Telecommunications System (UMTS); 3G security; Security threats and requirements; (3GPP TS 21.133 version 4.1.0 [Release 4]

ETSI TS 122 071; Digital cellular telecommunications system (phase 2+); Universal mobile telecommunications system (UMTS); LTE; Location services (LCS); Service description; Stage 1[Release 8 or later]

ISO/IEC 9646; Information technology — Open Systems Interconnection — Conformance testing methodology and framework
5 Needs for eCall Certification

In this Chapter, considering the answers provided in the questionnaires and attached in Appendix, preliminary considerations on needs for eCall certification are proposed.

Certification is needed with systems as wide-ranging as Pan-European 112 eCall. It is needed to ensure that the system works in the whole EU (eSafety Forum 2006 & Francsics et al. 2008).

Considering the answers of the questionnaire all the organizations understand the certification almost in a similar way. All the organizations consider certification an important part of the pan-European eCall system.

5.1 Certification process

5.1.1 Description of certification

The Certification process can be defined in different ways depending on the field of activity in which the issue of certification is set. The International Organization for Standardization (ISO) defines certification as a process which ensures that the system or the part of system meets the requirements which are set out in (ISO/IEC/IEEE 24765:2010).

Ruotsalainen and Mykkanen (2010) define the certification from the information system point of view. They write that “certification is a process, which ensures that the information system or its components meets the requirements and specifications”. The certification process needs to also ensure that the information system is ready to put into service.

However it is to be understood that if the aim of certification is to ensure system compliancy and reliability, the actual certification process will consist of carrying out testing which can only aim to verify the compliancy of the device.

Certification is no guarantee that systems are compliant and reliable.

Depending on the type of certification, it could be defined by several phases: conformance testing, performance testing, production monitoring, review, audits, monitoring.

At this point, concerning eCall, the timetable for certification is challenging to achieve as no requirements for certification has yet been accepted and the certification can only be started when the manufacturer expects conformity of products or components to requirements.

This activity has to be coordinated by an independent organization, the certification authority, where all relevant sectors and actors are represented:
In the following Chapters considerations are provided taking into account the different elements involved in eCall.

5.2 In-Vehicle System (IVS)

5.2.1 In-use testing

In members’ replies to the questionnaires it is clearly reported the importance and necessity of a periodic IVS check. One option is the periodic vehicle inspection (PTI), when the IVS could be tested at the same time.

Inspection is mandatory in EU and it is also based on EU-directives. Nevertheless the EU sets only baseline for car inspections and then countries have their own national regulations. Currently it is not possible to inspect a car, which is registered in Finland, in other EU Member State so that the inspection would be valid in Finland where the car is registered in. A new directive for periodic inspection has been drafted and put into the normal legislative procedures to set it in force. A concern which arose from the answers was how to test the IVS. However there is a dedicated task force PTI through the European eCall Implementation Platform (EeIP) which has already defined a technical specification to allow for periodic inspection (EeIP TF PTI Technical Report V1.0.0).

There is still a great deal of discussion with the automotive industry regarding the issues relating to certification and PTI. What must be stated here is that it is clear from the outset that the language used in some areas of the industry to describe the certification process is not common, for this reason there is often confusion over the terms used. With respect to the inclusion of eCall into the PTI schedule there is a degree of reticence for this move, with other safety devices being pointed to as not being included in the PTI process egg Air Bags, so why eCall? One response to this is that for the first time a safety device is fitted to a vehicle will have direct connectivity to the outside world. eCall is the first in a line of possible devices than can connect to other entities which could be either be vehicles or infrastructure, it follows then that we should be completely assured that the eCall device will continue to perform as it was designed without malfunction, PTI is one of the routes to this assurance.

5.2.2 OEM vs. After-Market fit 112 eCall in-vehicle devices.

The received answers from the questionnaires show that retro-fit eCall in-vehicle devices are very important since they make it possible to deploy the eCall system in older cars, where there is no 112 eCall system factory installed, it provides additional safety to older cars, and
will increase the number of eCall equipped vehicles in a Country, which will have a direct influence on casualty figures. But it is necessary to ensure that all devices on the market meet the requirements set by the published standards, so as not to interfere with either the operation of the vehicle which has the after-market IVS fitted not the normal operation of the receiving PSAPs.

The Directive 2007/46/EC gives also guidelines on the topic of OEM vs. After-Market fit devices. Directive 2007/46/EC Chapter II Article 4 states, Member States: “They shall not prohibit, restrict or impede the registration, sale, entry into service or circulation on the road of vehicles, components or separate technical units, on grounds related to aspects of their construction and functioning covered by this Directive, if they satisfy the requirements of the latter.”

5.3 Mobile Network Operator (MNO)

5.3.1 MNOs’ state of readiness

The Global System for Mobile Communications Association (GSMA) the official body representing the mobile network provider industry, and signatories of the eCall memorandum of understanding. It is a point of public record that the GSMA on behalf of the mobile network industry, have undertaken to ensure that all mobile networks are upgraded with ETSI TS 124 008 [Release 8 or later] before the end of December 2014.

For Mobile Networks there is no need to imply certification. Due to the long experience in their business, the MNOs are well prepared to achieve required availability and performance after the initial trial period. As such the member states have to urge the MNOs in license requirements to implement required functionality for eCall as soon as possible.

5.3.2 Recognise eCall identifiers (flags)

eCall identifiers, flags, make possible to the MSC (Mobile Switching Centre) to detect and differentiate 112 eCall and standard emergency 112 eCalls. If no eCall identifiers are present the received call shall be treated as a normal TS12 emergency call.

5.4 Public Service Answering Point (PSAP)

5.4.1 PSAPs’ state of readiness

As well as MNOs state of readiness, the PSAPs' state or readiness is a major concern in the lead up to eCall deployment.
PSAPs are at very different levels in terms of equipment and capability in preparation for the deployment of the pan-European 112 eCall system. This is especially so with Member States who are not members of HeERO and to date are not prepared for eCall.

This issue has been identified through the HeERO project which is why the 15 Pilot Site are leading the pre-deployment of the eCall system and the other MS will follow after that.

The following points have been raised by MS in seeking to understand the implications and necessary action for the introduction of eCall:

1. Has it been taken account that PSAP varies a lot between EU Member States?
2. Do the same modifications work in every Member State?

In answer to the questions raised the following should be noted. The 15 Pilot Sites in HeERO are trialling each version of PSAP architecture that is available in Europe. These system configuration are defined by the European Emergency Number Association (EENA)

It would simplify the modification process, if all modification could be certified prior to installation.

However the wide diversity of PSAP capability and architecture must result in PSAP’s handling eCall to be subject to a conformance process, which forms part of the certification. This process can either be carried out as MS level or by an independent body providing this service Pan – Europe to ensure consistency of standard.

There is a need to clarify if Pan European eCall based on 112 will increase foreign language calls to PSAPs’.

This situations could occur are some areas of Europe which are naturally subject to a highly transient vehicle usage where foreign nationals may need to make emergency calls or they can initiate an eCall.

In response the locations where there instances of high volumes of foreign registered vehicle traffic are already known to the authorities, and in many MS there are already systems and services in place to address these issues.

All eCall permits in addition to the provision of language services is the early identification of the vehicle, coupled with the precise location and time of the incident. The HeERO projects have clearly demonstrated that these issues are well known and dealt with efficiently as the PSAP operation stands now before the deployment of eCall which will only be enhanced by these capabilities.
D6.3 Needs for eCall Certification


In particular, it’s worth mentioning the Article 7 Rules on liability:

“1. The eCall PSAPs must be able to demonstrate to the competent authorities that they meet all specified conformance requirements of the eCall standards listed in Article 3 (1) in respect of the part(s) of the system under their design and/or control. They shall be liable only for that part of the eCalls for which they are responsible, which starts at the time the eCalls reach the eCall PSAP, in accordance with national procedures.

2. To that end, and in addition to other existing measures related to the handling of 112 calls in particular, both the raw MSD received with the eCall and the MSD contents presented to the eCall operator shall be retained for a determined period of time, in accordance with national regulations. Such data shall be stored in accordance with Articles 6, 13 and 17 of Directive 95/46/EC.”

The needs for PSAP are summarized in Table 1.

5.4.2 Silent eCalls

Regarding the handling of silent eCalls there is a degree of uncertainty. There are many options which could lead to silent eCall being generated; much of the uncertainty is related to PSAP operator training, and also the examination of standard operating procedures for PSAP operators when dealing with incidents on the highway. However it must be pointed out that the issue of silent calls is not new, is has been in existence from the inception of single emergency numbers. Many MS have dedicated solutions to this issue, which this report suggests could continue to be used along with specific training strategies and operating procedures. Minimising false eCall

It is really important to minimize false eCalls especially those which are caused by technical failure. Therefore a self-declaration of the manufacture should be at least complemented by a certification of the IVS as too many false eCalls lower the reliability and a low reliability may detract from the system.

A great deal of work is being carried out in the HeERO projects, especially where the eCall is designated as a manually activated eCall. The HeERO project has addressed this issue on a number of levels.
1. With the recognition in some pilot sites that if an eCall is received and it is automatically generated, then there is a high degree of confidence that the eCall is correctly generated and the mobilization of the first responders is expedited.

2. Where an eCall has been manually generated, a number of solutions have been developed across the pilot sites
   a. To place an intermediate PSAP to screen manually activated calls
   b. To put in place technical measures that will deal with either technical malfunction of the eCall, be it either manual or automatic activation or where there is either malicious intent over the eCall activation or accidental activation these can be resolved technical. However the key to many of these situations is public education and information.

5.4.3 VIN from EUCARIS

Vehicle Identification Number (VIN) data is included in the 112 pan-European harmonised eCall system MSD information.

Modern-day Vehicle Identification Number systems are based on two related standards, originally issued by the International Organization for Standardization (ISO) in 1979 and 1980; ISO 3779[4] and ISO 3780,[5] respectively. Compatible but somewhat different implementations of these ISO standards have been adopted by the European Union and the United States of America. [6]

The VIN is composed of the following sections:

<table>
<thead>
<tr>
<th>Standard</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
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</thead>
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<tr>
<td></td>
<td>12</td>
<td>13</td>
<td>14</td>
<td>15</td>
<td>16</td>
<td>17</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ISO 3779  
World Manufacturer Identifier VDS  VIS
European Union  
& North America  
more than 500 vehicles/year

World Manufacturer Identifier Vehicle Attributes  
Check Digit  Model Year  Plant Code  
Sequential Number

European Union  
& North America
fewer than 500 vehicles/year

World Manufacturer Identifier 9  Vehicle Attributes  Check Digit  Model  Year
Plant Code  Manufacturer Identifier  Sequential Number

World Manufacturer Identifier

The first three characters uniquely identify the manufacturer of the vehicle using the World Manufacturer Identifier or WMI code. A manufacturer who builds fewer than 500 vehicles per year uses a 9 as the third digit, and the 12th, 13th and 14th position of the VIN for a second part of the identification. Some manufacturers use the third character as a code for a vehicle category (e.g., bus or truck), a division within a manufacturer, or both.

The first character of the WMI is the region in which the manufacturer is located. In practice, each is assigned to a country of manufacture, although in Europe the country where the continental headquarters is located can assign the WMI to all vehicles produced in that region (Example: GM Europe cars whether produced in Germany, Spain, UK, Belgium or Poland carry the W0 WMI because GM Europe is based in Germany).

In the notation below, assume that letters precede numbers and that zero is the last number. For example, 8X-82 denotes 8X, 8Y, 8Z, 81, and 82. In particular this does not include 80.

Country codes [edit]

Vehicle Descriptor Section

The 4th to 8th positions in the VIN are the Vehicle Descriptor Section or VDS. This is used, according to local regulations, to identify the vehicle type, and may include information on the automobile platform used, the model, and the body style. Each manufacturer has a unique system for using this field. Most manufacturers since the 1980s have used the 8th digit to identify the engine type whenever there is more than one engine choice for the vehicle. Example: for the 2007 Chevrolet Corvette U= 6.0L V8, E= 7.0L V8.

Vehicle Identifier Section

The 10th to 17th positions are used as the Vehicle Identifier Section or VIS. This is used by the manufacturer to identify the individual vehicle in question. This may include information on options installed or engine and transmission choices, but often is a simple sequential number. In North America, the last five digits must be numeric.

Model year encoding
One consistent element of the VIS is the 10th digit, which is required worldwide to encode the model year of the vehicle. Besides the three letters that are not allowed in the VIN itself (I, O and Q), the letters U and Z and the digit 0 are not used for the model year code.

In order to identify exact year in passenger cars and multipurpose passenger vehicles with a GVWR of 10,000 or less, one must read position 7 as well as position 10. For passenger cars, and for multipurpose passenger vehicles and trucks with a gross vehicle weight rating of 10,000 lb (4,500 kg) or less, if position 7 is numeric, the model year in position 10 of the VIN refers to a year in the range 1980–2009. If position 7 is alphabetic, the model year in position 10 of VIN refers to a year in the range 2010–2039.

The model year for vehicles with a GVWR greater than 10,000 lb (4,500 kg), as well as buses, motorcycles, trailers and low speed vehicles may no longer be identified within a 30-year range. VIN characters 1–8 and 10 that were assigned from 1980–2009 can be repeated beginning with the 2010 model year.

Plant Code

Another consistently-used element (which is compulsory in North America) is the use of the 11th character to encode the factory of manufacture of the vehicle. Although each manufacturer has its own set of plant codes, the location in the VIN is standardized.

In order to fully exploit the information contained within a VIN a decoder programme is required one such system used by the HeERO project is the EUropean CAR and driving license Information System (EUCARIS), however some pilot sites are using commercially available VIN decoding systems which will also provide some of the information

It should be noted that VIN’s decoding is not available in all Countries, however the commercially available VIN decoders will provide the basic information concerning the vehicle, however EUCARIS may be able to provide keeper details.

There is a still a discussion taking place over the use of VIN: what is the real help of VIN? From a first responder perspective, the precise information over the exact make model colour and year of manufacture of a vehicle are vital in achieving a successful rescue. It should be recognised that today’s vehicles are without doubt highly dangerous and complex pieces of equipment, and dangerous to try to cut without the appropriate safety knowledge. It should also be borne in mind that as propulsion systems become ever more complex there is a real need to know exactly what the fuel type of the vehicle is VIN can provide this information.
5.4.4 Location data

Data regarding accurate location are crucial. 112 eCall is designed so that it does not collect any location data, until required, and as a result protects the privacy of the individual which is a fundamental human right. eCall will provide the location of the vehicle the heading and previous locations to ensure an accurate location. The proposed amendment to type approval for the introduction of eCall will possibly specify that each IVS shall be capable to receiving and processing at least 2 global navigation systems and services (GNSS) one of which shall be Galileo.

There are many directives concerning mobility and privacy issues. For example Directive 2009/136/EC says: “Directive 2002/58/EC (Directive on privacy and electronic communications) provides for the harmonisation of the provisions of the Member States required to ensure an equivalent level of protection of fundamental rights and freedoms, in particular the right to privacy and the right to confidentiality, with respect to the processing of personal data in the electronic communications sector, and to ensure the free movement of such data and of electronic communications equipment and services in the Community”. 
### Table 1: Needs for PSAP

<table>
<thead>
<tr>
<th>Need</th>
<th>Importance</th>
<th>Proposed solution</th>
<th>Timetable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Better informing</td>
<td>High</td>
<td>Regular information for stakeholders</td>
<td>Directly</td>
</tr>
<tr>
<td>Testing</td>
<td>High</td>
<td>Component testing as well as eCall testing needs to be increased.</td>
<td>Directly</td>
</tr>
<tr>
<td>Taking into account all the Member States</td>
<td>Medium</td>
<td>HeERO 2 project is starting. Is it enough?</td>
<td>2013</td>
</tr>
<tr>
<td>Privacy issues</td>
<td>Low</td>
<td>As no data is transmitted for an eCall only IVS, there is no privacy issue</td>
<td>2013</td>
</tr>
</tbody>
</table>

### 5.5 Member State specific issues

Each Member State has its own national circumstances, which pertain to the introduction of eCall. There are basically two options: either 112 eCall takes them into account or each Member State needs to adapt and change them. However all basic requirements of eCall are defined on European level in standards and have to be implemented identically.

### 5.6 General

The general issues, emerging in the questionnaires, could be listed as follows:

- Need to have a single and shared approach.
- Clear instruction and advices to citizens.
- Data privacy issues.
- Use of the data for traffic management and incident management.
- The role of the traffic management.
- Legislation is needed to take into account in every level.
5.6.1 Timetable

Timetable with certification is going to be tight. Most of the organizations understand the situation and say that the undefined things should be clarified before the end of 2013. The ideal situation would be that issues could have been solved three years before the introduction of the pan-European eCall; nevertheless this timeline is already unachievable. The certification process itself takes time: the lack of certification does not necessarily mean that the pan-European eCall could not be implemented and put into use, but of course this is not the optimal situation.

5.6.2 Legislation

Everything concerning 112 eCall must be in accordance with the European and national law.

5.6.3 Types of the certification

There are different ways to deal with the certification process. The pan-European 112 eCall certification process may be organised for example by self-assessment, self-declaration, national certification entity, type-approval, and voluntary certification.

Most of the organisations consider type-approval as a good option; however this is not certification, and may be regarded as the lowest possible option, as the type approval amendment applies to the whole vehicle not just eCall.

For IVS type approval is not regarded as sufficient and the current view expressed by the subject matter experts working on behalf of the HeERO Standardisation Task Force believe that the IVS should be subject to certification.
6 Proposed questionnaires: overview

A set of questionnaires have been proposed to collect information with respect to eCall Certification. All the questions and answers received are reported in Appendix. This chapter offers a synthetic overview of the requested information.

6.1 Questionnaire for all project beneficiaries

A questionnaire for all project beneficiaries has been forwarded to all partners within HeERO project without taking into account their level of involvement and resulting knowledge in certification.

The questionnaire together with the respective answers is provided in Appendix 1.

In the following paragraphs a brief overview of the topics of the questionnaire is illustrated: a list of more general questions on eCall Certification and then specific questions related to the In-Vehicle System (IVS), Public Safety Answering Point (PSAP) and Mobile Network Operator (MNO) are proposed.

6.1.1 General understanding of eCall certification process

The first part of the questionnaire has the aim to identify how the certification process is understood in the organization.

Mainly, the following points are requested from the organization point of view:

- Certification processes used in the organization.
- On-going or planned certification processes concerning European 112 eCall.
- Experiences in any certification process.
- The need of the organization concerning the 112 eCall and the most crucial needs regarding Pan-European 112 eCall.
- How the process of certification could be organized in Member States.

6.1.2 In-vehicle System (IVS)

The contribution required for the IVS aims to investigate how to ensure that IVS can operate according to the requirements. The questions are related to some of the most important
functions of IVS and partners are asked to describe how it would be most appropriate to certificate that each functionality is correctly managed, on the basis of their knowledge.

The following aspects are taken into account:

- 112 eCall initiation signal, confirmation that eCall Initiation signal is received and established voice link to PSAP.
- Verification that a voice calls can be established with the PSAP operator following the transmission, and acknowledgement, of the eCall MSD.
- Verification that following completion and clear down of a 112 eCall or test call, the IVS has the capability to remain registered on the mobile network for at least 60 minutes, to allow call back from the PSAP if required.

6.1.3 Public Safety Answering Point (PSAP)

Concerning the Public Safety Answering Point (PSAP), the questions investigate how to certify that the following functionalities can operate according to the requirements:

- eCall arrives to the PSAP as a public emergency (TS12) call and that Caller ID and location data are available and interpretable.
- Initiation signal by PSAP in-band modem.
- MSD transfer and Received MSD: after successful MSD transfer, the PSAP shall check the MSD content automatically. If the format check succeeded, the PSAP shall subsequently automatically send the positive application layer acknowledgement (AL-ACK) to the IVS so it can be received within 5s from reception of the link layer acknowledgement (LL-ACK).
- Display TS12 data and MSD to operator: MSD data, caller ID and caller location are available in PSAP operator interface. In order to be able to claim it can support 112 eCall, a PSAP is required to be equipped with a software application that can receive, validate and display the MSD contents to its operator(s).
- Voice call establishment between vehicle occupants and PSAP operator: if the caller is able to speak, the call will be handled as a normal 112 call.
- PSAP operator is able to clear down the call. The PSAP operator may instruct the clear-down of the call at any time after the MSD is received or after T8 (PSAP MSD maximum reception time, 20 seconds) or T4 (PSAP wait for INITIATION signal period, 2 seconds). On receipt of the MSD and/or completion of the telephone
conversation with the vehicle occupants, the PSAP operator shall clear-down the 112 eCall.

6.1.4 Mobile Network Operator (MNO)

Concerning the Mobile Network Operator (MNO), the questions investigate how to certify the following aspects:

- The registration is successful in the network, following initiation of a 112 eCall or test call from an IVS NAD (Network Access Device e.g. a GSM or UMTS module) provisioned for the 112 eCall only or 112 eCall plus other services.

- Recognise eCall identifiers (flags): MSC can detect and differentiate 112 eCall identifiers for manually and automatically initiated 112 eCalls. If no eCall identifiers are present then the received call shall be treated as a normal TS12 (non-eCall) emergency call.

- Route call to ‘most appropriate’ PSAP: 112 eCall is routed to the intended PSAP.

- Provision of TS12 data/caller ID: when a 112 eCall is established the mobile network provides the caller ID and location data to the PSAP.

- Call in progress: Maintain communication channel until 112 eCall clear down.

- Maintain registration from 1 hour up to 12 hours after the 112 eCall clear down.

- Transition from 3G to LTE (Long Term Evolution): currently 112 eCall is designed to function in 2,5G (GPRS) and 3G (UMTS). No sustainable mitigation and/or contingency plans exist to ensure eCall is also functional in LTE networks.

- Retro-fit/after-market 112 eCall in-vehicle devices: current 112 eCall directive indicates that 112 eCall IVS is integral part of type approval process, thus requiring IVS to be integrated by OEM into the vehicle. For obvious reasons retrofit/aftermarket 112 eCall in-vehicle devices may be requested by various stakeholders.
6.2 Questionnaire for MS-leaders and targeted certification group

The questionnaire proposed in Appendix 2 has been sent to MS-leaders and targeted certification group in order to get information concerning 112 eCall certification.

The answers have the aim to provide an overview regarding the high-level understanding about proposed topics. The questions involved the following aspects.

- Importance of the 112 eCall certification.
- Process for the 112 eCall certification and stakeholders there should be involved.
- Consideration regarding how to carry out the 112 eCall certification process: end-to-end certification or separate certification for IVS, PSAP and MNO.
- Certification organization: there should be one common EU-wide certification organization and/or certifier or should each country have a separate certification organization?
- National certification: which organization would give the national certification organizations the guidelines for the certification process?
- Benefits of the certification from the organization point of view?
- How Certification can help to solve the open issues for eCall.

6.3 Questionnaire specified for car industry

The questionnaire proposed in Appendix 3 targets car industry in order to get information concerning 112 eCall certification.

The following questions have been proposed:

- In your opinion who is responsible for installing the IVS devices? Is it car manufactures or car importers?
- How to ensure that IVS operates as it should? (E.g. self-testing, national testing entity, type-approval only, other EU-wide mechanism, other).
- What problems have you occurred or you are afraid you will occur concerning 112 eCall, especially concerning car industry?
- Current 112 eCall directive indicates that 112 eCall IVS is integral part of type approval process, thus requiring IVS to be integrated by OEM into the vehicle. For
obvious reasons retrofit/aftermarket 112 eCall in-vehicle devices may be requested by various stakeholders.

- What is your opinion on the need for retro-fit/after-market 112 eCall in-vehicle devices?

- What kind of requirements should be set on retro-fit/after-market 112 eCall in-vehicle devices?

- What kind of certification process should be set on retro-fit/after-market 112 eCall in-vehicle devices?
7 References


Directive, 2007/46/EC

Directive, 2009/40/EY

Directive, 2009/136/EC

EN 16062, Intelligent transport systems – ESafety – ECall high level application requirements (HLAP). 64 p.

EN 16072, Intelligent transport systems - ESafety – Pan European eCall- Operating requirements. 27 p.


HeERO, D3.2 Operation test report Sweden, version 1.0, 17.7.2012.


Appendix 1. Questionnaire

1 Instructions to fill this questionnaire

All project beneficiaries are kindly requested to answer the questionnaire in those issues they are familiar or connected with either as a company / organisation or in more general terms.

Questions can be seen also as arousing/inspiring ideas – answers can be written also informally, so feel free to use the questionnaire topics as it is the best for you.

Please send filled questionnaires to
timo.hanninen@ramboll.fi

Deadline for submitting the questionnaire is 25-5-2012.

Also any questions concerning the questionnaire can be addressed to Timo Hänninen.

Please write your organisation and name here:

Organisation:

Name:

Thank you for your participation
2 Objectives of the questionnaire

- The purpose of this questionnaire is to collect information concerning 112 eCall certification. This questionnaire is made for deliverable 6.3 where Ramboll is the lead participant.

- There are questions from three different points. First questions 2.1.1-2.1.8 are related to certification first generally and then concerning to 112 eCall. The second part of questions, 2.2 -2.3, covers all three major parts: In-Vehicle System (IVS), Public Service Answering Point (PSAP) and Mobile Network Operator (MNO). Open issues are dealt with last part.

**First part (questions 2.1.1-2.1.8) is meant for all organisations. Second part and third part (2.2 – 2.5) are targeted to all organisations, but specific response is requested from organisations which work at the same field of business as questions concern.**

NC: NavCert GmbH

AREU: Azienda Regionale Emergenza Urgenza, Piero Maria Brambilla

CRF: Centro Ricerche FIAT S.C.p.A, Maria Paola Bianconi

STA: Trafikverket, Swedish Transport Administration, Mr. Johnny Svedlund

TN: Telenor Sweden AB, Mr. Henrik Samuelsson

SOSA: SOS Alarm AB, Mr. Björn Skoglund

ADAC: Allgemeiner Deutscher Automobil-Club e.V., Bernfried Coldewey

Qualcomm: Nikolai Leung

TCZ /O2: Telefonica Czech Republic

FW: Ford-Werke GmbH, Duncan Burrell

NPRD: National Protection and Rescue Directorate, Pavao Britvić

RWS: Rijkswaterstaat, Jan van Hattem
Questionnaire

2.1 Certification in general

2.1.1 How certification is understood in your organization?

NC: An independent entity provides its experts opinion that the evaluated good or service is in accordance with the respective standard

AREU: Being a Healthcare related organization AREU is very interested in any certification that could make easy the safety of the work process

STA: Not involved in this kind of certifications

Qualcomm: Certification is the process by which products/implementations are approved for deployment by passing required tests under the oversight of a certification body.

TCZ: In Telefonica Czech Republic, as. certification is considered as one of the most important areas that contribute to quality of company. Areas of certification are given to a considerable part of our efforts. We are going through re-certification process every year done by external agency TÜV NORD Czech, s.r.o.

FW: Certification has three main elements. Firstly there is the certification of components, for example if we fit a GSM or Bluetooth module to the vehicle we would ensure it is certified (by the supplier) to the relevant standards. Secondly there is Type Approval. This is how we effectively “certify” that the vehicle meets the legal requirements of Whole Vehicle Type Approval. Thirdly, being an American Company, self-certification plays a big part of our business, especially for vehicles going into US.

NPRD: In NPRD certification procedures exists for standard operating procedures for 112 system.

RWS: Depending on the nature of the subject no general answer possible.

2.1.2 What kind of certification processes are used in your organization?

NC: Depending on requirements of scope and accreditation

We have a Quality Management System, based on the ISO 9000.

SOSA: SOS Alarm is certified according to the international standard ISO 9001:2008 for quality management, and ISO 14001:2004 for environmental management.
D6.3 Needs for eCall Certification

According to the agreement between SOS Alarm and the Swedish state regarding the emergency number 112, it is mandatory for every SOS-operator handling 112-calls to be certified every year. This certification is done on a yearly basis and contains a number of questions where the operator must be passed on to be allowed to continue to answer 112-calls. The certification is done in Arena, a system that is also used for e-learning.

Qualcomm: For certification of the radio protocol aspects of cellular devices for Europe we generally rely on the Global Certification Forum (GCF).

TCZ: For certification process we are using integration management system. The Telefonica Czech Republic, as. is especially certified in:

- QMS - Quality Management System according to EN ISO 9001:2008
- EMS - Environmental Management System according to EN ISO 14001:2004
- OHS - occupational health and safety management system OHSAS 18001:2007
- ITSM - ITSM Management System according to ISO / IEC 20000-1:2005
- ISMS - ISMS management system according to ISO / IEC 27001:2005

We are also certified in technical areas supporting our business like a IT a MOBILE/FIX technologies.

FW: As discussed above we are most familiar with type approval in Europe, and self-certification in US. We also conduct validation testing on for software, hardware and systems against internal standards.


RWS: All types of certification, equipment suppliers, working methods, contractors etc.

2.1.3 Are there any on-going or planned certification processes concerning Pan-European 112 eCall in your organization?

NC: Yes, we intent to offer certification for eCall.

AREU: Not at the moment

CRF: no
SOSA: There is no on-going or planned certification process, but handling eCalls will require inclusion of questions (as well as training of the operators) in the certification of SOS-operators.

Qualcomm: We are working with the GCF to identify and validate the tests needed to certify eCall devices for cellular networks.

TCZ: No.

FW: No

NPRD: Currently eCall certification does not exist in NPRD.

RWS: No this has to be developed

2.1.4 What kind of experiences do you or your organisation have about any certification process? If any, please also specify in which certification process.

NC: In depth experience with voluntary and mandatory certification

AREU: No relevant experience

SOSA: SOS Alarm has positive experiences to both the ISO-certification and the certification of SOS-operators. They both give us the opportunity to evaluate quality on a regular basis.

ADAC: ADAC call centre is ISO certified ISO 9001

Qualcomm: We actively participate in the development of test cases in the 3GPP RAN5 and GERAN3 working groups. We are also active participants in contributing and maintaining work items in the Global Certification Forum (GCF). We also cooperate with test equipment vendors as well as accredited test houses towards verifying and validating test cases in various technologies.

TCZ: The certification is our advantage, if not a condition for participation in tenders and obtaining new business opportunities. These above show that the certification process approach organizations with an effort to continually improve and bring to customer better quality.

FW: See above, but most relevant here is our vast experience of type approval.

NPRD: Certification procedure in NPRD is defined by Croatian law.

Certification process consists of the following steps:

1. Interdisciplinary task force defines standard operating procedure
D6.3 Needs for eCall Certification

2. The procedure is being tested through simulation and communication exercise

3. Standard operating procedure is being tested in test environment

4. After the successful finalisation of previous steps, task force approves the procedures

5. Approval of standard operating procedures from key ministries

6. After approval from key ministries, procedure is formally being signed by NPRD director

RWS: Involved in various standard development

2.1.5 What kind of needs do you or your organisation have in general concerning Pan-European 112 eCall?

NC: Appointment of accreditation entity to apply for

AREU: Just understand what is actually to be implemented in a PSAP

CRF: IVS certification within type approval

STA: That it will be a boost for also other services

SOSA: Every technical system has its flaws. SOS Alarm is concerned about the risk of some technical error generating repeated eCalls to a PSAP and thereby causing disturbance and load on the PSAP. And there is also risk of false eCalls, done on purpose. We therefore think it is important that the PSAP has the possibility to manually block out calls from a certain car/number.

ADAC: No specific needs, since we are not a direct part of the 112 eCall service chain

Qualcomm: We develop chipset solutions that are used in IVS devices to support eCall. We need clear certification guidelines that will enable us to develop compliant solutions that our customers can use to achieve certification of their devices. Moreover, we need clear certification guidelines for the PSAPs and mobile networks to ensure proper performance of the entire eCall system.

FW: We need clear standards to be defined and verified well in advance of system development. We also need all legal requirements to be set prior to system development. In this respect we need clear boundary for the IVS to ensure that type approval of eCall only concerns those elements which are managed by the vehicle (i.e. not including GSM module, SIM, Network, PSAP etc.).

We need any legislative requirements to be technology neutral to ensure maximum flexibility and promote innovation.
We need for the infrastructure to be in place across Europe prior to any mandatory fitment requirements in our vehicles.

NPRD: Based on existing experience based on Emergency 112 system implementations, NPRD has recognised several potential issues as follows:

To define possible issues in eCall implementation
To define all necessary system components
To define system upgrade required for eCall
To establish eCall interoperability and cross-border continuity
To propose changes in legislative defining eCall

RWS: The need to reduce any false alarms

2.1.6 What are the most crucial needs concerning Pan-European 112 eCall from your or your organisation viewpoints?

AREU: Have a single approach by all the organization involved (Automotive, Telco etc.)

CRF: IVS certification within type approval

SOSA: The most important is the reliability of the system. If there are a lot of false alarms, due to technical malfunction or human intervention, there is a risk that eCall alarms will be regarded as not “real” 112-calls. We have this problem in Sweden with automatic fire alarms today, where about 95% is false.

ADAC: The 112 eCall service must be a reliable and stable public emergency service, available anywhere throughout the defined countries of coverage (EU-27 and Associated States).

As a public service it needs to remain free of charge for the citizens respectively users. The users need to be advised how and where eCall can help - and where not. Data privacy issues have to be considered and fully respected.

Qualcomm: Certification of eCall device, PSAP, and mobile network implementations is needed to ensure performance of the end-to-end eCall system.

TCZ: We consider as most critical issue eCall interoperability. It is necessary to reach a stable level of standards and specifications before the eCall launch in 2015 and, of course, to keep it during eCall operation as well. Back compatibility need in case of new release of In-
D6.3 Needs for eCall Certification

band modem, otherwise we will have to invest a lot of money to the periodical PSAP modem upgrade (implementation, testing cost, etc.)

FW: See above – technology neutrality and infrastructure to be in place.

NPRD: Most crucial need for NPRD is existing system upgrade and creating prerequisites for operational eCall system.

RWS: Reliability of the eCall chain and the information

2.1.7 Within what time the occurred problems concerning Pan-European 112 eCall should be agreed upon?

NC: In 2013 all regulations and relevant bodies should be identified

AREU: Before end 2013

CRF: 3 years before mandatory regulations

ADAC: Within the reasonable time possible.

FW: Verified standards and legal requirements should be available a minimum of 3 years prior to the introduction of pan-European eCall. This is to ensure a robust, high quality and cost effective market deployment.

NPRD: In 2014th, after the successful completion of HeERO 1 project in accordance with available resources.

RWS: Question to general to be answered

Technical issues have to be cleared but also other area’s are of importance

2.1.8 From your organisation point of view, how the Pan-European 112 eCall certification process should be organised in Member States? (e.g. self-assessment, self-declaration, national certification entity, type-approval, other EU-wide, other)

AREU: Self assessment with audit from national certification entity

STA: Type-approval

SOSA: It is important that the standard is international (EU-wide) and used by all concerned and that the equipment is properly tested before put in use. Some kind of type approval is probably necessary, to ensure this.
ADAC: National certification and/or type-approval

Qualcomm: Member States should be able to recognise an EU-wide or global certification scheme. This would enable manufacturers to develop and certify their products (devices, PSAPs, mobile network equipment) in a uniform and economical manner.

TCZ: Preferably by a combination of type-approval and national certification authority

FW: We understand that eCall will be mandated under WVTA; hence the only route by which the IVS can be certified is type approval. The boundary for the IVS should be clearly defined and in Ford’s view this should not include the NAD. The NAD will be a certified component anyway, so there is no need to cover this again. Any end to end testing required should be left to the vehicle manufacturer to handle via self-assessment.

NPRD: This point requires further analysis since it is directly linked to Croatian law creating bodies.

RWS: It should be better thought of then the present text of TEN-T delegated act.

2.2 In-vehicle System, IVS

2.2.1 How to ensure that IVS operates as it should? (e.g. self-testing, national testing entity, type-approval only, other EU-wide mechanism, other)

CRF: IVS supplier certification plus type approval

SOSA: SOS Alarm thinks it is important that some kind of regular (yearly) testing is done to ensure that every vehicles eCall system is in full working order, but wants to stress that this must NOT be ensured by an test-eCall from the car to the PSAPs. No test calls should be allowed to the PSAPs: Our suggestion is that this instead is done in the yearly mandatory inspection by every car (in Sweden) which is done by certified control organs.

ADAC: Self testing function (but avoiding calling 112!) and function tested within periodical technical inspections.

Qualcomm: Manufacturers do self-testing and make declarations of conformity. The rules and tests are as specified by the GCF for ETSI aspects of devices. A similar certification organization, such as ERTICO, could set the rules for certification of the CEN aspects of eCall devices.

TCZ: The eCall problematic should in this way follow other areas of the ITS with specific focus on the European Electronic Tolling Service (EETS). There have already been defined
the framework conditions related to the certification mechanisms of EETS on-board units on the European level. Related general concept (not the testing scenarios) should be considered and mirrored in relevant areas into the eCall environment.

FW: Self-testing at OEM discretion and type-approval only.

NPRD: This point requires further analysis since it is directly linked to Croatian law creating bodies, but in NPRD opinion IVS should be tested once a year.

RWS: It should be better thought of then the present text of the E2E standard: self declaration is not sufficient. – what are the sanctions and what possibilities do the MS have to correct any mistakes by manufacturers. (NONE!)

The following issues are related to some of the most important functions (with its description) of IVS. Based on your understanding how would it be most appropriate to certificate that each functionality is correctly managed. Also let us know if there are any needs still remaining concerning a specific phase. The issues 2.2.2-2.2.4 are related to 2G/GPRS/3G and they are already well defined.

CRF: Is IVS in a" stand alone" configuration (on test bench) or integrated in a vehicle?

Are the following issues foreseen for certification procedure or test procedure?

2.2.2 Network registration

Description: Verify that when a 112 eCall or test calls are initiated that the IVS registers or has already registered on the MNO test point.

How to certify this functionality:

Qualcomm: We suggest to use the test cases approved by 3GPP Test Specification and scripts developed by ETSI Task Force 160 for GCF certification of non-modem aspects of eCall.

TCZ: Description is unclear – what is MNO test point? Anyway, this is focused rather on GSM/3G module inside the IVS unit. So this should be tested onto these modules and then the modules can achieve “eCall certified mark” – and then we can use it for eCall IVS and be sure they work properly. The IVS manufacturer mostly will anyway forward it to its GSM module supplier.
FW: The IVS NAD shall perform the network registration in accordance with ETSI TS122011 and this shall be verified as part of the NAD GSMA certification and not repeated as part of the IVS type-approval.

NPRD: By self test.

Remaining concerns for certification:

### 2.2.3 Send 112 eCall initiation signal

Description: To verify that if network registration fails but networks are present (limited service / emergency calls only condition) the IVS attempts to make the 112 eCall.

How to certify this functionality:

#### 2.2.3 eCall in limited service mode

Qualcomm: There are approved test cases that verify Emergency Call function of devices in 3GPP Test Specification. These test cases are part of the regular GCF Certification process and are readily available.

TCZ: To perform laboratory tests according to the description above related to the combination of IVS hardware-type and particular firmware version. Specific test purpose is to confirm, that GSM Emergency setup is being used for eCall session.

FW: The ability to place a 112 call when the primary network registration fails and networks are present (limited service / emergency calls only condition) has to be supported by current NAD that meet the GSMA standards and support the 112 service, and should not be re-certified as part of the IVS type approval process.

NPRD: IVS should automatically connect to other eCall enabled network after the beginning of 2015. All MNO should implement eCall in their network.

Remaining concerns for certification:

### 2.2.4 Confirm that eCall Initiation signal is received

Description: To verify that the initiation signal is received, PSAP needs to send conformation back to IVS so it does not try to send initiation signal again.
How to certify this functionality:

Qualcomm: Certification could be based on the CEN end-to-end conformance document test of IVS-initiated signalling, CTP 1.1.10.3

TCZ: To perform laboratory tests according to the description above related to the combination of IVS hardware-type and particular firmware version. This is in most cases functionality of GSM module itself, since in-band modem functionality is part of it, so it can be tested directly on GSM module. GSM modules should have possibility to indicate the received signals and store this information into the respective log.

FW: Once the initiation signal is received by the PSAP and the PSAP responds with an acknowledgment message, this can be certified by reading the link-layer acknowledgments between the PSAP and the IVS.

NPRD: Since this is technical issue, this proposal should be made by IVS and PSAP manufacturers.

Remaining concerns for certification:

### 2.2.5 Establish voice link to PSAP

Description: Verify that a voice call can be established with the PSAP operator following the transmission, and acknowledgement, of the eCall MSD.

How to certify this functionality:

Qualcomm: Certification could be based on the CEN end-to-end conformance document test of establishing a voice link to the PSAP, CTP 1.1.15.1

TCZ: To perform laboratory tests according to the description above related to the combination of IVS hardware-type and particular firmware version. It would be useful to have an “etalon PSAP environment” for this testing to simulate same conditions.

FW: TS12 is to be available even if the MSD was not successfully received / transmitted. Ford recommends self-assessment for verification of this functional item.

NPRD: Since this is technical issue, this proposal should be made by IVS and PSAP manufacturers.

Remaining concerns for certification:
2.2.6 **Remain registered for ≥1 hr**

Description: Verify that following completion and clear down of a 112 eCall or test call, that the IVS has the capability to remain registered on the mobile network for at least 60 minutes, to allow call back from the PSAP if required.

How to certify this functionality:

Qualcomm: We suggest to use the GCF certification for eCall. There are two test cases on IVS capability to remain registered on the mobile network for a period of 12 hours.

TCZ: To perform laboratory tests according to the description above related to the combination of IVS hardware-type and particular firmware version.

FW: This should not be a criterion for certification of the IVS.

Remaining concerns for certification:

CRF: Not clear how to power IVS system.....

TCZ: On IVS it should be tested end-to-end and operation problems (for example no response after pressing the SOS button, eCall cancelled by another request for communication etc.).

2.3 **Public Safety Answering Point, PSAP**

SOSA: Sweden is part of the HeERO project and has already tested all the functions in the actual Swedish PSAP-system that is used in everyday 112 call handling. These tests have showed that the functions described below are in working order.

2.3.1 **Receive TS12 data- Caller ID & location**

Description: Verify that eCall arrives to the PSAP as a public emergency (TS12) call. Caller ID and location data are available and interpretable.

How to certify this functionality:

TCZ: It should be done by monitoring of a signalling in the network (fixed or mobile) where PSAP is connected.

Remaining concerns for certification:

AREU: Done
2.3.2 Validate initiation signal

Description: PSAP in-band modem validates initiation signal. The 112 eCall shall be routed to the PSAP in-band modem which shall listen for the ‘INITIATION’ message (signal) sent by the IVS. The ‘INITIATION’ message (signal) from the IVS shall persist until the IVS has received a ‘SEND MSD’ message from the PSAP in-band modem.

How to certify this functionality:

Qualcomm: Certification could be based on the CEN end-to-end conformance document, CTP 3.1.5.1

TCZ: PSAP modem has to have a capability to log all significant messages. For certification purposes a PSAP etalon should be used instead of real production PSAP

Remaining concerns for certification:

AREU: Done

2.3.3 Verify MSD transfer – Receive MSD

Description: After successful MSD transfer, the PSAP shall check the MSD content automatically. If the format check succeeded, the PSAP shall subsequently automatically send the positive application layer acknowledgement (AL-ACK) to the IVS so it can be received within 5 s from reception of the link layer acknowledgement (LL-ACK)

How to certify this functionality:

Qualcomm Certification could be based on the CEN end-to-end conformance document, CTP 3.1.7.1.

TCZ: PSAP modem has to have a capability to log all significant messages. For certification purposes a PSAP simulation should be used instead of real production PSAP

Remaining concerns for certification:

AREU: Done

2.3.4 Display TS12 data and MSD to operator

Description: MSD data, caller ID and caller location are available in PSAP operator interface. In order to be able to claim it can support 112 eCall, a PSAP is required to be equipped with
a software application that can receive, validate and display the MSD contents to its operator(s).

How to certify this functionality:

TCZ: This is PSAP function; it is not a matter of eCall certification itself.

Remaining concerns for certification:

AREU: Done

### 2.3.5 Talk to Vehicle Occupants

Description: Verify voice call establishment call between vehicle occupants and PSAP operator. If the caller is able to speak, the call will be handled as a normal 112 call.

How to certify this functionality:

Qualcomm: Certification could be based on the CEN end-to-end conformance document, CTP 3.1.12

TCZ: For certification purposes probably no real PSAP operator can be used. Instead of this, we suggest to use auto answer and personal announcement on PSAP side.

Remaining concerns for certification:

AREU: Done

SOSA: SOS Alarm thinks that it is important to further investigate and consider how to handle eCalls where no one in the car says something. Does this mean that the driver/passengers have left the car? Are they all unconscious? Is the eCall a false alarm, triggered by a technical failure?

How shall the emergency services handle a call with no contact? We/they might agree to handle it as a real 112-call as long as the system proves to be reliable, with no or only a few false alarms. But this will soon change if the system is triggered by other means than real incidents.

Is there a way/system to further investigate the reason for the eCall alarm – can verification also be done by camera or some other device?
2.3.6 Call clear down

Description: Verify PSAP operator is able to clear down the call

The PSAP operator may instruct the clear-down of the call at any time after the MSD is received or after T8 (PSAP MSD maximum reception time, 20 seconds) or T4 (PSAP wait for INITIATION signal period, 2 seconds). On receipt of the MSD and/or completion of the telephone conversation with the vehicle occupants, the PSAP operator shall clear-down the 112 eCall.

How to certify this functionality:

Qualcomm: Certification could be based on the CEN end-to-end conformance document, CTP 3.1.14.1

TCZ: This is native function of PSAP application, no need to certify it.

Remaining concerns for certification:

AREU: Done

TCZ: To our opinion, more important is to certify MSD update – before and after clear down – on PSAP side. Again, testing PSAP should be used for it and special application that simulates real PSAP operator.

2.4 Mobile Network Operator, MNO

2.4.1 Accept registration

Description: Verify that, following initiation of a 112 eCall or test call from an IVS NAD (Network Access Device e.g. a GSM or UMTS module) provisioned for the 112 eCall only or 112 eCall plus other services, the registration is successful in the network.

How to certify this functionality:

TCZ: Signalling network monitoring is necessary for this.

NPRD: Since this is technical issue, this proposal should be made by mobile network equipment manufacturers.

Remaining concerns for certification:
2.4.2 Recognise eCall identifiers (flags)

Description: Test that the MSC can detect and differentiate 112 eCall identifiers for manually and automatically initiated 112 eCalls. If no eCall identifiers are present then the received call shall be treated as a normal TS12 (non-eCall) emergency call.

How to certify this functionality:

TCZ: Signalling network monitoring is necessary for this. Problem is that this test is not about one MSC but all MSCs in the country. Periodical test is necessary due to the fact that configuration in MSC can be changed accidentally e.g. We suppose it is a matter of discussion with each MNO.

NPRD: This requires successful eCall testing in laboratory environment

Remaining concerns for certification:

2.4.3 Route call to ‘most appropriate’ PSAP

Description: It is needed to make sure that the 112 eCall is routed to the intended PSAP.

How to certify this functionality:

TCZ: It is rather periodical check than certification. Basically two possibilities:

a) Signalling network monitoring – check that MSC assigns proper routing number

b) Periodical check of MSC routing tables done by each MNO

We suppose it is a matter of discussion with each MNO.

NPRD: On site testing should prove this functionality.

Remaining concerns for certification:

2.4.4 Provide TS12 data/caller ID

Description: Verify that, when a 112 eCall is established the mobile network provides the caller ID and location data to the PSAP.

How to certify this functionality:
TCZ: It is rather periodical check of MNO behaviour. Basically two possibilities:

a) Signalling network monitoring – check that MSC assigns caller ID and location data
b) Periodical check on the testing PSAP level

We suppose it is a matter of discussion with each MNO.

NPRD: Location data should be verified through GIS and caller ID by PSAP application.

Remaining concerns for certification:

### 2.4.5 Call in progress

Description: Maintain communication channel until 112 eCall clear down.

How to certify this functionality:

TCZ: Unclear, what should be certified?

NPRD: It depends on Mobile and PLMN operator.

Remaining concerns for certification:

### 2.4.6 Maintain registration for 1-12 hours

Description: Maintain registration after the 112 eCall clear down from 1 hour up to 12 hours.

How to certify this functionality:

TCZ: Unclear, what should be certified?

NPRD: Since this is technical issue, this proposal should be made by mobile network equipment manufacturers.

Remaining concerns for certification:

### 2.5 Open issues

#### 2.5.1 Transition from 3G to LTE (Long Term Evolution)

Description: Currently 112 eCall is designed to function in 2,5G (GPRS) and 3G (UMTS). No sustainable mitigation and/or contingency plans exist to ensure eCall is also functional in LTE networks.
How do you see the transition to LTE should be ensured?

TN: As far as we know LTE doesn’t have a common/standardized solution for handling eCall

ADAC: Through standardization

Qualcomm: There are two scenarios we see depending on how soon the PSAPs can be upgraded to support an Internet Protocol (IP) interface:

Mobile Network Operator maintains circuit-switched networks (at least 3G UMTS) until majority of devices are LTE-capable and all served PSAPs are able to support IP interface for eCall over LTE.

Mobile Network Operator maintains circuit-switched networks (at least 3G UMTS) until majority of devices are LTE-capable. A media gateway is used to establish interworking between eCall over LTE devices and PSAPs not equipped yet with IP interfaces, i.e., PSAPs using the eCall in-band modem interface.

FW: Either the NAD must be abstracted from (e.g. brought in by the vehicle user) the IVS to allow migration thorough the vehicle lifecycle or the infrastructure and standards must maintain backwards compatibility to ensure support the entire vehicle lifecycle.

NPRD: Transition should be ensured flawless and without impact on NPRD or end user.

Real issue not yet addressed! - RWS

What is your opinion should the transition to LTE be an issue for standardisation entities?

Qualcomm: There is work that needs to be done by standardization entities to specify how eCall shall be supported over LTE. As part of the standardization of eCall over LTE, it should also be clarified how devices, networks, and PSAPs, can transition from current eCall over 2G/3G deployments to eCall over LTE.

NPRD: Yes, standardization entities should confirm the eCall would work on LTE networks.

Both! - RWS

What is your opinion should it be left for commercial stakeholders e.g. MNOs, telecom suppliers?

CRF: It can be an issue for standardization entities but moreover for infrastructure interoperability and legacy issues.

TN: We believe that some kind of standardisation is needed, but we also believe that 2G and 3G networks will be alive for many years (it is not urgent/showstopper for eCall). Focus should be on a IP based solution.
D6.3 Needs for eCall Certification

ADAC: To be resolved within standardization with the support of involved commercial and non-commercial stakeholders.

Qualcomm: An industry-wide consensus based migration path is needed. Standardization entities will take the lead.

NPRD: Standardisation should be performed by non commercial stakeholders.

2.5.2 Retro-fit/after-market 112 eCall in-vehicle devices

Description: Current 112 eCall directive indicates that 112 eCall IVS is integral part of type approval process, thus requiring IVS to be integrated by OEM into the vehicle. For obvious reasons retrofit/aftermarket 112 eCall in-vehicle devices may be requested by various stakeholders.

If this is the case we should review the directive and ask for a change or update- RWS

What is your opinion on the need for retro-fit/after-market 112 eCall in-vehicle devices?

CRF: They may be needed depending on regulations

STA: It should be available

ADAC: After-market eCall devices will foster the public awareness regarding eCall and may stimulate the overall interest and demand for 112 eCall service and related additional services both, free of charge and commercial.

After-market products are best suited to serve the needs from users of existing cars on the roads.

TCZ: Retro-fit/after-market should be allowed. The real usage of this option will be than given by the market itself (offer-demand).

NPRD: These devices are required for non new vehicles.

RWS: Important for the success of eCall is that after market devices are stimulated as much as possible!

What kind of requirements should be set on retro-fit/after-market 112 eCall in-vehicle devices?

CRF: They should be easily integrated in a vehicle; the supplier of the devices should have the responsibility of the system functionalities and of the compliance to standards
ADAC: Related to 112 eCall functionality, they – basically - have to comply with the existing standards for Pan-European eCall.

TCZ: The same like for OEMs with the other special focus placed on the eCall priority management (in case of any other service running on IVS). The only difference could be testing according to EN16072 - chapter 8.5, where some crash tests are stated. This is not feasible for aftermarket units and must be replaced by other method of testing.

NPRD: The device must fulfil all eCall related requirements defined by standards.

RWS: The standards as they are should be enough, matter to be research further

What kind of certification process should be set on retro-fit/after-market 112 eCall in-vehicle devices?

CRF: The devices should be certified before vehicle integration and after vehicle integration with dedicated procedures

SOSA: SOS Alarm sees a risk that retro-fit/after-market equipment is not as reliable as the regular eCall-system installed in new cars.

ADAC: If possible, the same as for factory-fitted OEM in-vehicle devices.

TCZ: The same like for OEMs with the other special focus placed on the eCall priority management (in case of any other service running on IVS).

NPRD: At annual vehicle inspection.

RWS: Something better than the present self declaration!

RWS: MISSING ISSUES:

Link to traffic management

Use of the data for traffic management and incident management.
Appendix 2. Questionnaire for MS-leaders and targeted certification group

1 Objectives of the questionnaire

The purpose of this questionnaire is to get information concerning 112 eCall certification. This questionnaire is made for deliverable 6.3 where Ramboll is the lead participant. Questions can be seen also as arousing/inspiring ideas – answers can be written also informally, so feel free to use the questionnaire topics as it is the best for you. We would like to know, what your high level understanding about following topics is.

STA: Trafikverket, Swedish Transport Administration, Mr. Johnny Svedlund

ITSRO: ITS Romania, Mr. Dorin-Mircea Dumitrescu

NC: NavCert GmbH

FW: Ford-Werke GmbH, Mr. Duncan Burrell

EENA: European emergency number association, Ms. Cristina Lumbreras

TCZ / O2: Czech Republic, Ministry of Transportation, Mr. Martin Pichl
2 Questionnaire

2.1 How important do you see the 112 eCall certification? Why or why not?

STA: E112 eCall certification should ensure that the service work seamlessly from all types of vehicles and all OEM-brands in all MS, and that the PSAPs in all MS will correctly handle the eCalls. An E112 eCall certification is important to secure seamless interoperability between IVSs, PSAPs, and PLMNs (and MNOs).

However, the term “certification” may describe different levels of certainty for service quality for the organisations working with vehicles, mobile networks and PSAPs. The meaning of “certification” is not understood as the same thing for all stakeholders. Are type approval for example a type of certification or does we mean something else?

ITSRO: The 112 eCall system contains subsystems and equipment compliant with “Directive 1999/5/EC on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity” with later modifications and addenda (Regulation 1882/2003EC and Regulation 596/2009EC). The 112 eCall system is also an emergency and road safety system. As such, the112 eCall certification process is mandatory.

TCZ / O2: Within the context of 112 eCall certification it is necessary to consider the aspect of public confidence. In the case of a serious road incident the eCall shall activate relevant squads of the rescue system immediately after the incident, regardless of mental or physical state of the driver or other passengers or in the case of worsened possibility of verbal transferring information from the caller/vehicle passenger.

If, in these situations, the eCall system failed, the public could stop the trust for this system. This could be a significant barrier for the eCall deployment.

2.2 What kind of process the 112 eCall certification should be? Which stakeholders there should be involved in? Please provide response as an open text answer.

STA: Some or all of the stake holders, depending on the purpose and content of the certification: Stakeholders: Equipment manufactures; IVS (OBU) manufactures, PLMN equipment manufacturers, PSAP equipment manufacturers, Vehicle manufacturers, national 112 emergency centres (PSAP), Accredited test laboratories (for example Eurofins, CETECOM, 7Layer etc.).
Vehicle Type Approval shall preferably be able to perform with any certification body that are used for vehicles today. Current type approval process should be extended with eCall on a complete vehicle level.

ITSRO: We consider that the certification process has to be compliant with “Decision 768/2008/EC on a common framework for the marketing of products, and repealing Council Decision 93/465/EEC”. We propose the use of B modules (type certification) – for prototype certification of various subsystems and equipment – together with either module C, D or E – for repetitive manufacturing. A notified body, specialized in car electronic systems, must be involved in the certification process.

NC: The certification should be divided in two parts, one the IVS the other the PSAP. There are different aspect which have to be considered, disjunctive regulations and independent stakeholders.

The stakeholders for IVS are component manufacturers, system integrators, OEMs and aftermarket suppliers.

For PSAPs we have mainly public authorities or private organization acting on behalf of public institutes.

FW: In Europe vehicle “certification” is handled by type approval... according to 2007/46/EC, the Recast Framework Directive. If eCall is mandated in Europe then it should also be handled by type approval as a system under 2007/46/EC or 661/2009/EC, the General Safety Regulation. This process involves the OEM (and possibly the supplier), a Technical Service and the Type Approval Authority only.

The other parts of the eCall chain would presumably also need certification of sorts but this should be handled by normal processes associated to those parts (e.g. the MNOs and PSAPs must also have existing processes) and should happen independently from OEMs.

EENA: Stakeholders that have to be involved should be: IVS and cars manufacturers, mobile network operators and PSAPs receiving eCalls.

A standard certified simulator for each of the parts of the eCall chain, i.e. IVs, mobile network and PSAP systems have to be available for the rest of stakeholders. This way, for example a PSAP will be able to test its system with an IVS simulator and a mobile network simulator.
TCZ / O2: This process would deal with the conformity assessment procedure for products/components and comprehensive assessment of system reliability and safety.

The conformity certificate should be given to those products whose characteristics are consistent with the requirements of the relevant (common European) specifications and technical standards defined for individual phases of the life cycle. Compliance with the required standards should be assessed by an independent third party - by Testing Laboratory - which must be accredited.

The certificate will ensure the end user (to the consumer) with a certain guarantee that the product has been tested and meets the requirements of technical standard (the component has a defined quality).

The eligibility of conformity certificates among different certification bodies significantly prevents the anti-monopoly "single" evaluator within one state and it also allows manufacturers easier access to foreign (European) markets.

The assessment should also include regular inspection of the manufacturer that complies with the conditions under which the certificate was granted and also the (regular) inspection of PSAP, Telco and In-Vehicle System in order to test the components reliability.

The assessment should take into account also the process of system design, implementation and reliability issues in order to ensure the proper performance and functionality. Based on Member States competencies the framework/guidelines for implementing/introducing new products should be established. Guidelines should define the conditions under which new devices can be put into operation. Assignment of specific responsibilities and recommended role to individual stakeholders should be a matter of national law and practice.

2.3 Should the 112 eCall certification process be carried out as end-to-end certification or should IVS, PSAP and MNO be certificated separately? Please elaborate your response to provide us a better understanding of your approach.

STA: The systems should be certified separately according to each systems (OEM, MNO, PSAP) current procedures and, if possible, in some aspects also end-to-end (see below)

For instance, for the IVS, the On-Board Unit, OBU, should be certified on product level to achieve a certificate that proves that the OBU fulfils the applicable eCall and ETSI standards (similar procedure as for E-Mark and R&TTE).
D6.3 Needs for eCall Certification

The complete IVS should be certified on complete vehicle level, take into account the existing process for certification in relation to the current type approval process. The IVS should be certified against a reference PSAP environment.

Certification of eCall for MNOs and PLMNs should be handled in accordance with the current E112 regulations, certifications and test procedures.

ITSRO: A separate certification of each subsystems [IVS, PSAP, NMO segment] will be necessary, taking into account that:

The manufactures of the subsystems are completely different

The technology and testing procedure are specific for the three subsystems

The end-to-end testing, assuring the interoperability between subsystems are necessary and not certification [such interoperability tests could be perform in European projects; e.g. HeERO]

NC: There should be a certification for PSAP and IVS, for MN nor MNO no certification is expected

FW: No, the eCall certification should not be carried out end-to-end. The IVS part should be handled as a standalone portion and only include those elements for the OEM is responsible (i.e. should not depend on networks etc).

EENA: It would be more efficient to certificate IVS, PSAP and MNO separately. It would be optimal to have an end-to-end certification, but it would be very difficult to test all combinations from IVSs, PSAPs and MNOs across Europe.

TCZ / O2: The 112 eCall certification process shall be differentiated for 2 cases. In the first case it deals with introducing of the new (complex) system in the market (into the operation). In this case the end-to-end certification shall be carried out. The second case deals with inspection in phases in life cycle of components. It is possible to carry out the IVS, PSAP and MNO certification/regular inspection separately.
2.4 Should there be one common EU-wide certification organization and/or certifier or should each country have a separate certification organization? Please elaborate your response to provide us a better understanding of your approach.

STA: Each MS should be certified at least once, or at least, testing that the eCall service works in each MS should be done. Testing thereafter needs to be better understood before giving recommendations.

All vehicle OEM’s should also (on type-level) be tested end-to-end, this should be done on European level.

The OBU:s should be certified by Accredited test laboratories, this could be the labs that today handle 2G/3G type approvals (for example Eurofins, CETECOM, 7Layer etc.).

It should be possible to certify the eCall system functionality for the IVS-system in the vehicles at any accredited laboratory available. An OEM should be allowed to select the one they prefer. In Sweden it could be assumed that several stake holders would find it interesting to offer such a service nationally and EU-wide.

A yearly end to end certification/inspection should be decided by each MS (form for how this in such case should be done is however unclear).

ITSRO: Considering that the 112 eCall system will cover the entire EU territory we believe that a single European certification body would not have the necessary capacity, mobility and flexibility. It will require national bodies, coordinated if needed, by a European entity.

Usually for similar electronic equipment the certification process is the responsibility of national certification entity, mutually accepted between EU countries.

NC: Certification should be independent of member state borders. There should be private certification bodies which may offer their service within Europe independent of the location of their organization. The certification will be recognized at least on European or better worldwide level.

FW: At least for the IVS portion, there is not a need for additional certification organizations. Type approval is already handled by the type approval authorities. This should not change.

EENA: As it is a EU-wide system, it has to be certified that all combinations from IVSs, PSAPs and mobile network networks will work correctly. In my opinion a common EU certification is needed.

TCZ / O2: Each state should establish a separate certification process and to authorize certification bodies according to national law and practice (see also 2.2).
2.5 Which organization would give the national certification organizations the guidelines for the certification process and why?

STA: See 2.3

ITSRO: The certification process determines and testifies to the compliancy of a product with essential requirements set by standards, technical specifications and other relevant documents. The course of the certification process is specified in decision 768/2008/EC so that, in principle, no additional indications are required. It is important that the technical specifications for the 112 eCall subsystems and equipment are properly drafted (the technical conditions must be precise and measurable). For the 112 eCall certification methodology’s uniformity the existence of the coordinating entity mentioned above would be useful.

NC: As we are mainly working with CEN standards for eCall, the accreditation could be regulated in a European directive like EMC or low voltage.

FW: No comment

EENA: CEN has developed the eCall standards, and, in my opinion it should be CEN who gives the certifications.

TCZ / O2: In the case of the Czech Republic the methodology “General requirements for products certification bodies within the accreditation system of the Czech Republic” must be followed.

What kind of monitoring/control is needed for 112 eCall certification?

STA: The Accredited test laboratories are audited on regular basis.

ITSRO: Decision 768/2008/EC establishes the methods for monitoring the certification process. It is not necessary any supplementary measures.

NC: I am not quite sure I understand this question. So I provide several answers:

As usual the certification has a validity to be agreed upon. After expiration a recertification can be performed a defined number of times. Thereafter a new certification is required.

The evidence of the certification is a label which has to be attached to the relevant product same as of today. The fact that the product is certified will be published in a list of issued certificates by the accredited certification body. A list of accredited certification bodies is published as of today on European level.
FW: At a minimum there is a need to monitor the deployment of eCall in the MNOs and PSAPs across Europe. At present it is not possible to get a clear overview of the state of readiness in all countries and as we get closer to mandatory fitment in vehicles this is not acceptable.

EENA: I think the same monitoring and control that is now in place for other EU certifications. Once the eCall is working, it should be a process for the stakeholders and users to avoid malfunctioning of eCall systems.

TCZ / O2: This control can be covered by the process of (European) conformity assessment.

2.6 What is the most important benefit the certification may offer from your organization point of view?

STA: It ensures an approved solution that will work anywhere in EU27.

ITSRO: The certification must ensure quality for the 112 eCall system, subsystems and equipment and not allow noncompliant products that may compromise the systems well functioning to enter the market.

TCZ / O2: To ensure the quality of components introduced in the market and to protect users against falsified eCall components.

What is your main concern(s) with 112 eCall, and do you see the certification might provide help for resolution?

STA: Standards always give some room for interpretation, a certification procedure will secure that the implementation of the standards in a product is correct (interoperability).

Measures to assure that the service works over the life span of the vehicle should be considered.

ITSRO: The main concern with 112 eCall is the assurance of interoperability between different IVSs and different PSAPs. The certification process, based on proper specifications, may reduce this risk at an acceptable level.

Besides certification it is important to ensure the well functioning of the 112 eCall system, subsystems and equipment for their whole life cycle. Periodical checks are necessary.

TCZ / O2: The eCall identifies faster and more easily the exact location of the incident by the immediate transfer of standardized data report (MSD) informing about the incident and its precise location along the parallel establishment of the voice-call with the 112 emergency
operator; such MSD helps to eliminate language barriers between the vehicle occupants and the emergency operator, which is important in the European multi-language environment. The full benefits of the eCall service will be achieved when the service will work across Europe in a seamless way. Therefore the certification will ensure that the component has a defined quality.
Appendix 3. Questionnaire specified for car industry

1 Objectives of the questionnaire

The purpose of this questionnaire is to get information concerning 112 eCall certification. This questionnaire is made for deliverable 6.3 where Ramboll is the lead participant. Questions can be seen also as arousing/inspiring ideas – answers can be written also informally, so feel free to use the questionnaire topics as it is the best for you. We would like to know, what your high level understanding about following topics is.

FW: Ford-Werke GmbH, Mr. Duncan Burrell
2 Questionnaire

2.1 In your opinion who is responsible for installing the IVS devices? Is it car manufactures or car importers?

FW: The responsibility of the IVS device installation shall belong to the car manufacturer. The car manufacturer shall have the right to outsource the IVS device installation process to a third party/supplier if needed.

2.2 How to ensure that IVS operates as it should? (e.g. self-testing, national testing entity, type-approval only, other EU-wide mechanism, other)

FW: Type-approval only should be a sufficient method in determining the operability of the IVS. In addition to the type-approval process self-testing and validation will be conducted to ensure that the IVS device meet the regulations.

2.3 What problems have you occurred or you are afraid you will occur concerning 112 eCall, especially concerning car industry?

FW:

PSAP(s) and MNO(s) readiness across all the European countries by 2015,

The need to have a neutral set of standards that support different IVS platforms (i.e. nomadic & embedded solution).

The introduction of a new technology in the future that replaces the in-band modem technology (i.e. packet-data, SMS)

The phase-out possibility of the current available 2G and 2.5G networks in the near future.

Current 112 eCall directive indicates that 112 eCall IVS is integral part of type approval process, thus requiring IVS to be integrated by OEM into the vehicle. For obvious reasons retrofit/aftermarket 112 eCall in-vehicle devices may be requested by various stakeholders.

2.4 What is your opinion on the need for retro-fit/after-market 112 eCall in-vehicle devices?

FW: The design of the retro-fit/after-market IVS devices shall be of a flexible architecture in order to be compatible with different platforms of cars for different car manufactures. The
OEMs shall not be responsible for any retrofit/after-market products that are not produced by the OEM.

2.5 What kind of requirements should be set on retro-fit/after-market 112 eCall in-vehicle devices?

FW: The requirements for the retro-fit/after-market devices should at least satisfy the requirements applied to the OEM integrated IVS devices.

2.6 What kind of certification process should be set on retro-fit/after-market 112 eCall in-vehicle devices?

FW: No comment.