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European foreword

This document (CEN/TS 17312:2019) has been prepared by Technical Committee CEN/TC 278 “Intelligent transport systems”, the secretariat of which is held by NEN.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document was developed as part of the I_HeERO project and subsequently prepared by Technical Committee CEN/TC 278.

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Introduction

In accordance with a European Regulation, from March 2018, all new model Class M1/N1 vehicles will be equipped with 112-eCall. Other model class M1/N1 vehicles may be voluntarily equipped with *112-eCall* and eCall support for other classes of vehicles will be enabled in the near future.

In its study CEN/TR 17249-1, the report observed that where a *satellite telecommunications service provider* supports IMS, this means that 112-eCall over IMS can be supported, in accordance with CEN/TS 17184, via the satellite telephone network, because IMS is an IP based service which is radio agnostic. Generally, this means IMS eCall can be supported by any IP network and so will enable eCall via satellite in IMS supporting satellite networks. (However, there is no fall-back to circuit switched eCall.) Satellite communications that support internet protocol, but do not support IMS, may be able to provide the service using an agreed CeIMS.

Satellite networks are geared for handling emergency calls – in terms of prioritization and handling. In the maritime sector, the use of satellite networks is mandated and regulated for ships above a certain size. Similar emergency call services have existed for decades on satellite networks for personal safety.

Most current satellite telephone systems support access to the internet through the use of IP protocol, and therefore support IP-addressing. These systems are technically able to support IMS-112-eCall. This of course requires a satellite communications transceiver in the vehicle, but modern satellite communications systems can now usually be accessed by a standard-sized sharks-fin or flat panel antenna.

As with other existing eCall provision, this specification is based on OEM fit equipment. The provision of eCall for aftermarket vehicles will be the subject of other work.

It should also be noted that there will be no fall-back provision to circuit switched eCall in the event that there is no local PSAP equipped to handle IMS (as provided for in 3GPP release 14), but this is not required (see below).

As the 'cell' for a satellite system covers the entire continent, an eCall via satellite cannot identify the "most appropriate" PSAP from the location of a cell tower, and so an alternative system is bound to be specified.

Modern satellite telecommunications systems have the advantage that most (but not all) systems provide the GNSS location of the source as part of the call establishment (in order to align signals between source and satellite) and can therefore identify the location of the vehicle to a 1st level reception point PSAP. The GNSS location information is not usually available outside of the network, except for certain types of services, but can be made so for safety services.

This means that, in countries where the Administration is prepared to provide the *satellite telecommunications service provider* with a single central level 1 PSAP IP address for satellite eCalls, eCalls can be provided and supported in remote locations where there is limited or no 2G/3G/LTE/4G coverage available. As, in this paradigm, the call is always made over IMS to an IMS capable level 1 PSAP address, there is no requirement for fall-back to circuit switched eCall.

The central 1st level PSAP can then identify the GNSS location of the source of the eCall and redirect the IMS VOIP call to the "most appropriate PSAP" on the basis of the GNSS location information provided in the call establishment, or, where the GNSS location is not available in the call establishment, can read the MSD to find the location of the vehicle and similarly redirect the IMS VOIP call to the "most appropriate PSAP". As the communication session is packet switched, call forwarding to the most appropriate PSAP is a simple exercise and the MSD will be provided in the call setup (and therefore available in any call forwarding).

Where the Administration is not prepared to offer a central 1st level PSAP address to the *satellite telecommunications service provider*, satellite eCall can be provided via a TPSP.

Note, however, that eCalls over satellite (and certainly TPSP calls via satellite) are unlikely to be provided free of carrier network charges and require satellite communication transceiver equipment in the vehicle.

Satellite-IMS-112-eCall is likely to be of particular interest to Administrations where there are users for categories of vehicle that have to cross areas of intermittent cellular coverage and across multiple countries and road networks. This may also be of interest for agricultural and forestry vehicles in locations where low population density (such as rural areas, Northern Scandinavia and mountainous regions) does not justify the provision of land based cellular telephone networks.

NOTE Support for *Satellite-IMS-112-eCall* is probably not needed in countries where there is good mobile network coverage across the length and breadth of the land.

For vehicles known to spend significant time in areas that do not have the benefit from good GSM/UMTS/LTE/4G coverage, *Satellite-IMS-112-eCall* can provide the benefit of eCall to vehicle users.

This document provides specifications for the provision of eCall via satellite telecommunications.

1 Scope

In respect of *112-eCall* (operating requirements defined in EN 16072), this document defines specifications for the provision of eCall via satellite communications networks (*Satellite-IMS-112-eCall* and *Satellite-TPS-eCall*).

As with the existing provisions for eCall for Classes M1/N1 vehicles, these are specified within the paradigm of OEM fit equipment at the point of manufacture.

This document includes only the requirements for the provision of *Satellite IMS-112-eCall* using satellite telecommunications and *Satellite-TPS-eCall*.

NOTE The *112-eCall* paradigm involves a direct call from the vehicle to the *most appropriate PSAP*. (Third party service provision by comparison, involves the support of an intermediary *third party service provider* (TPSP) before the call is forwarded to the PSAP.)

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 15722:2015, *Intelligent transport systems — ESafety — ECall minimum set of data*

EN 16062, *Intelligent transport systems — ESafety — eCall high level application requirements (HLAP) using GSM/UMTS circuit switched networks*

EN 16072:2015, *Intelligent transport systems — ESafety — Pan-European eCall operating requirements*

EN 16102:2011, *Intelligent transport systems — eCall — Operating requirements for third party support*

EN 16454, *Intelligent transport systems — ESafety — ECall end to end conformance testing*

CEN/TS 17148, *Intelligent Transport Systems — eSafety — ProForma eCall Agreement between TPSP and PARES*

CEN/TS 17184, *Intelligent transport systems — eSafety — eCall High level application Protocols (HLAP) using IMS packet switched networks*

CEN/TS 17240, *Intelligent transport systems — ESafety - eCall end to end conformance testing for IMS packet switched based systems*

CEN/TR 17249-1, *Intelligent transport systems — eSafety — Part 1: Extending eCall to other categories of vehicle*

IETF RFC 8147, *Next-Generation Pan-European eCall*

IETF RFC 5031, *A Uniform Resource Name (URN) for Emergency and Other Well-Known Services*