Accessing data on dangerous goods using eCall

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1 Introduction

1.1 General

The eCall System has been developed for the use in cars. The system has obvious advantages. Emergency services can act faster, reducing the response periods and improving the survival rate of the victims. From that perspective, it is desired to implement the eCall system in trucks and busses as well. This proposal focuses on embedding information related to dangerous goods onboard trucks. Emergency Services require quick access to the information on the load of the vehicle, so that they can determine the right measures as fast as possible.

A research was conducted into the current situation in regard to the retrieval of information about dangerous goods involved in accidents. Based on that information several solutions for embedding this information into the eCall functionality were discussed. This document will only describe the proposal that comes forward from this research and analysis.

1.2 Required data on dangerous goods

The emergency services will require the following data for each dangerous material:

- The UN Code of the relevant material(s)[1], 0000-9999;
- The amount of each dangerous good in kilograms or liters, 0-99999;
- The package group (s) of the material(s), (I, II or III).

The most optimal situation will be such that the information of all dangerous goods involved will be made available. It is assumed that 80% of the transports involve 5 products or less, although there is no exact data available to support that assumption.

1.3 Proposed solution (concept)

Three possible sources of information about dangerous goods on board of the vehicle are defined:

- the eCall unit (which gets this information fed somehow)
- the Transport Management System (reachable for the PSAP)
- a person (driver or clerk at main desk)

In all cases the MSD should carry the necessary information. A conceptual design is described in the following figure:

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[1] The hazard identification number, that is present on the Kemmler plates, can almost always be deduced from the UN number. In the few cases where there is no unique binding, emergency services should prepare for the worst hazard identificatioin.
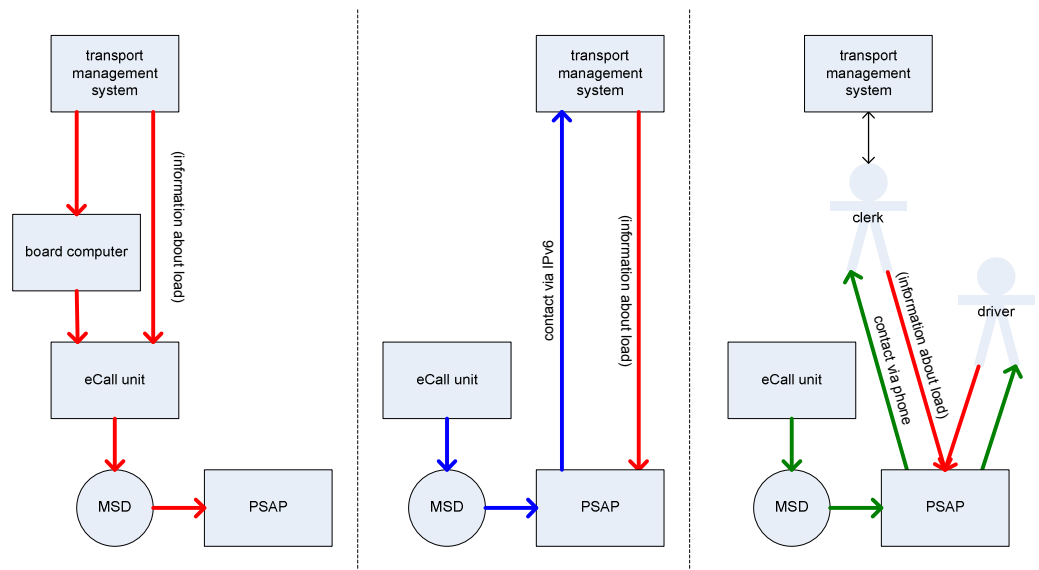
The main goal obviously is getting the information about the dangerous goods at the PSAP. The first and most optimal approach is based on an eCall unit that can be fed with information by either the board computer inside the truck, or the TMS via a remote connections.
In the other two options the eCall unit carries information that enable the PSAP to retrieve the information about the load elsewhere: either an IPv6 address of the TMS or a phone number of the transport company (preferred) or the driver. The phone-solution is the less optimal one as it does not offer an all digital all automated exchange of information between the different systems.

2 Proposed changes to the standard

2.1 Additional requirements to the eCall System

The eCall system has been standardized in a functional way by a set of requirements defined in CEN/TC 278, TC 278 WI 00278220:2009 (E), "Intelligent Transport Systems - ESafety – Pan European eCall – Operating Requirements", dated august 2010. The focus of these requirements is the use of eCall in cars, where the development and deployment of the actual (vehicle-based) hardware is left to the market. The current requirements should be extended (but not changed!) to accommodate the retrieval of information about dangerous goods.

a) The eCall system/procedures should assure that the relevant load information on dangerous goods can be retrieved rapidly to be used by the Emergency Services;

b) The functionality described in (a) should improve the Emergency Services without additional costs and/or additional effort of any of the parties involved;

c) Any solution should work across Europe with loads, trucks and drivers, shippers and receiving parties from different countries, making use of their own systems;

a) Retrieval of Load Information

If an accident occurs with a truck with dangerous goods, the relevant data (see 3.1) should be available as soon as possible. The Emergency Services should have a fast and direct access to the required information. From that perspective, an automated procedure is preferred and the data on the dangerous goods (as summarized in the Bill of Loading) should be provided in a digital form.

However, the options to retrieve the data automatically strongly depend on the systems that are available at the Truck Operator. Not all systems are suited for automated retrieval. Some Truck Operators not even have such systems, which means that the information is (digitally) available. Hence a non-automated back-up procedure should be available.

b) Effort to enter the data in eCall

The information about the dangerous goods provided to the eCall system should preferably not rely on the (additional) efforts of the driver or other people. Systems tend to be not kept up to date if this requires additional effort. For that reason, the data in the eCall unit should be fixed or automatically entered.

c) A European solution

The system should work across Europe with loads, trucks and drivers, shippers and receiving parties from different countries, making use of their own systems. As a consequence, the system has to be standardized across Europe. To insure the implementation, deployment and correct use of eCall for the provisioning of information about dangerous goods, the system should be part of the European legislation. For that reason, it is preferred to integrate the use of eCall in the European treaty of the international transport of dangerous goods (ADR).

2.2 Additional requirements for the eCall unit

The proposed concept is based on the assumption that the eCall unit can be fed with information. The current standard does not go into detail about how an eCall unit obtains the information to collate the MSD. This proposal adheres to this and only adds the requirements:

- (mandatory) to allow for the storage and manipulation of a phone number for retrieval of loading information
- (mandatory) to allow for the storage and manipulation of an indicator whether the truck is carrying dangerous goods
- (optional) to allow for the storage and manipulation of information about the load of the truck
- (optional) to offer means for the stored information to be manipulated by either a board computer or a remote TMS, where 'means' is defined broadly (ie. protocol, connectors, etc.)

2.3 Additional specification of the MSD contents

In this proposal Block 12 of the MSD ('additional data') is used to carry the required information. As in the current standard the block begins with an assigned object identifier (<oid>) that designates the remainder as 'additional data for dangerous goods'. Next follow two mandatory elements that signal whether or not dangerous goods are carried by the truck and the phone number for more information. Optional fields complete the data and carry an IPv6 address (and password) if an information endpoint exists and/or detailed information about the goods present.

Block No.	Name	Type	Mandatory Optional	Description
12a	oid	oid	M	assigned object identifier
12b	haz_mat_present	bool	M	true if hazardous materials are present
12c	haz_mat_phone	string[10]	M	phone number via which information about the load can be obtained (either transport company (preferred) or driver)
12d	haz_mat_ip	ipv6	O	IPv6 address information endpoint
12e	haz_mat_passwd	string[8]	O	Password to get access at information endpoint
12g,j,…	haz_mat_code	int[0..9999]	O	for 6 goods (the most dangerous if a truck has more than 6 goods): ▪ UN number ▪ Quantity (in rounded kg) ▪ Package group[2]
12h,k,…	haz_mat_quantity	int[0..9999]	O	
12i,l,…	haz_mat_packgr	byte	O	

[2] Package groups are noted in Roman number (I, II, III), but for reasons of data space in the MSD the use of 1, 2 and 3 is recommended.