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Intelligent transport systems — Framework for collaborative telematics applications for regulated commercial freight vehicles (TARV) —

Part 22: Freight vehicle stability monitoring

Systèmes intelligents de transport — Cadre pour applications télématiques collaboratives pour véhicules de fret commercial réglementé (TARV) —

Partie 22: Surveillance de la stabilité des véhicules de transport de marchandises

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 204, *Intelligent transport systems*.

A list of all parts in the ISO 15638 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

The unbalanced cargo inside the container loses vehicle stability condition and sometimes creates serious/dangerous situations where the vehicle loses control causing vehicle roll over on the road when speed exceeds the safe limit for that particular road circumstance. Some freight vehicles have a stability monitoring system on board; however most vehicles do not have such devices and adding a stability monitoring service from a remote service provider to the stand alone vehicle stability monitoring function can increase vehicle stability control during freight road transport. This document standardizes the conceptual operational framework of freight vehicle stability monitoring services provided by remote monitoring systems serviced by service providers. The ISO 15638 series of TARV application standards are based on a triumvirate of vehicle operators with in-vehicle systems, on-board application service providers and jurisdictions. The basic TARV standards focus on the transactions between these parties via ITS-stations, and roadside sensors and using this system architecture, additional remote vehicle stability monitoring service to freight vehicles can be realized. The new means of safe road transport management and enforcement may be enabled by using this document where jurisdiction needs such regulated monitoring.

It, therefore, seems appropriate to include this additional Part 22 to the ISO 15638 series of standards to provide the means to add safe road transport of freight vehicles.

It is necessary that the telematic applications can be integrated into the embedded computing systems available on the market. The need for interoperability of different solutions is also important as several actors with different solutions may be involved in information needs. Securing the data exchanged is also a particularly important point.

NOTE Related to EC regulations, ISO 15638-9[1)] already covers provisions consistent with EC 165/2014. This document is complementary to and not competitive to ISO 15638-9, and therefore consistent with EC 165/2014.

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Intelligent transport systems — Framework for collaborative telematics applications for regulated commercial freight vehicles (TARV) —

Part 22:
Freight vehicle stability monitoring

1 Scope

The ISO 15638 series of standards (Parts 1 to 21) define the framework for online fleet management of regulated commercial freight vehicles utilizing data communication between in-vehicle systems and an application service provider via on-board communication unit interfacing with road monitoring infrastructure and roadside sensors. In this document, an unregulated service architecture frame work for freight vehicle stability monitoring architecture is defined. This statement does not preclude the regulated service where jurisdiction needs such a function.

The objective of this document is to provide a freight vehicle stability monitoring service function/ application for non-enforcement applications [and sometimes for regulated application service (RAS)]. This is for road transport safety management purposes of regulated commercial freight vehicle movements. The scope of this document is to

a) Reinforce vehicle stability monitoring for non-enforcement and other purposes by providing safety advisory information provisions to the freight vehicle drivers/operators transporting heavy goods on the freight vehicles.

This document defines the framework for remote vehicle stability monitoring for non-enforcement and other management purpose applications conceptual operation.

This document is complementary to, and does not replace, any ISO 15638 series standards. This document is beneficial to vehicle monitoring management purpose entities and it provides additional use cases for TARV service applications.

This document is specialized towards the realization of safer road transport of freight vehicles by providing safety advisory information to the vehicle from the service provider and it utilizes ISO 15638 series of standards basic architecture framework defined in ISO 15638-21. The vehicle on-board sensor detected freight vehicle and/or freight container stability data and/or road side sensor data (vehicle stability status detection at roadside) are sent out to the service provider through ITS communication media. The service provider provides users with safety information such as recommended safe speed limit for that particular vehicle and gives speed limit advice messages as necessary. The various V2I communication paths can be used according to the various use cases.

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.

ISO 14816, *Road transport and traffic telematics — Automatic vehicle and equipment identification — Numbering and data structure*

ISO 15638 (all parts), *Intelligent transport systems — Framework for cooperative telematics applications for regulated commercial freight vehicles (TARV)*

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ISO 17262, *Intelligent transport systems — Automatic vehicle and equipment identification — Numbering and data structures*

ISO 24534-3, *Intelligent transport systems — Automatic vehicle and equipment data*

ISO 26683-2, *Intelligent transport systems — Freight land conveyance content identification and communication — Part 2: Application interface profiles*

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at http://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org

3.1
access methods
procedures and protocols to provision and retrieve data

3.2
app
small (usually) software applets, organized as software bundles, that support *application services* (3.3) by keeping the *data pantry* (3.18) provisioned with up to date data

3.3
application service
service provided by a *service provider* (3.36) enabled by accessing data from the *IVS* (3.23) of a *regulated vehicle* (3.33) via a wireless communications network

3.4
application service provider
ASP
party that provides an *application service* (3.3)

3.5
app library
separately secure area of memory in *IVS* (3.23) where apps are stored with different access controls to *data pantry* (3.18)

3.6
application service data file
ASD file
file held in the *data pantry* (3.18) of the *IVS* (3.23) containing data specific to an *application service* (3.3)

3.7
architecture
formalised description of the design of the structure of TARV and its *framework* (3.21)

3.8
audit
auditing
review of a party's capacity to meet, or continue to meet, the initial and ongoing certification agreements as a *service provider* (3.36)

3.9
authentication
function intended to establish and verify a claimed identity

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3.10
basic vehicle data
data maintained/provided by all *IVS* (3.23) [regardless of *jurisdiction* (3.27)]

3.11
certification
formal affirmation that an applicant has satisfied all the requirements for appointment as an *application service provider* (3.4) or that an application service delivers the required service levels

3.12
certification authority
<digital> organization which issues digital certificates for use by other parties (specifically in the context of communications security)

3.13
certification authority
<regulatory> organization (usually independent) which conducts *certification* (3.11) and ongoing *audit* (3.8) for *service providers* (3.36) on behalf of a *jurisdiction* (3.27)

3.14
commercial application(s)
ITS applications in *regulated vehicles* (3.33) for commercial (unregulated) purposes

EXAMPLE Asset tracking, vehicle and engine monitoring, cargo security, driver management etc.

3.15
consignment
shipment of goods/cargo to a destination

3.16
conveyance
vehicle or trailer used to transport from one place to another

3.17
cooperative ITS
C-ITS
ITS applications for both regulatory and commercial purposes that require the exchange of data between uncontracted parties using multiple *ITS-stations* (3.25) communicating with each other and sharing data with other parties with whom they have no direct contractual relationship to provide one or more *ITS services* (3.24)

3.18
data pantry
secure area of memory in *IVS* (3.23) where data values are stored [with different access controls to *app library* (3.5)

3.19
driver
person driving the *regulated vehicle* (3.33) at any specific point in time

3.20
facilities
layer that sits on top of the communication stack and helps to provide data interoperability and reuse, and to manage applications and enable dynamic real time loading of new applications

3.21
framework
particular set of beliefs and ideas referred to in order to describe a scenario or solve a problem

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3.22
global navigation satellite system
GNSS
several networks of satellites that transmit radio signals containing time and distance data that can be picked up by a receiver, allowing the user to identify the location of its receiver anywhere around the globe

3.23
in-vehicle system
IVS
ITS-station (3.25) and connected equipment on board a vehicle

3.24
ITS service
communication functionality offered by an *ITS-station* (3.25) to an *ITS-station* application

3.25
ITS-station
ITS-s
entity in a communication network, comprised of application, *facilities* (3.20), networking and access layer components specified in ISO 21217 that operate within a bounded secure management domain

3.26
Java™
object oriented open source operating language developed by SUN systems

3.27
jurisdiction
government, road or traffic authority which owns the r*egulatory applications* (3.31)

EXAMPLE Country, state, city council, road authority, government department (customs, treasury, transport).

3.28
local data tree
LDT
frequently updated data concepts stored in the on-board *data pantry* (3.18) containing a collection of data values deemed essential for either a) TARV regulated application service, or b) *cooperative intelligent transport systems* (3.17)

3.29
operator
fleet manager of a *regulated vehicle* (3.33)

3.30
prime service provider
service provider (3.36) who is the first contractor to provide *regulated application services* (3.32) to the *regulated vehicle* (3.33), or a nominated successor on termination of that initial contract

Note 1 to entry: The *prime service provider* is also responsible to maintain the installed *IVS* (3.23). If the *IVS* was not installed during the manufacture of the vehicle the *prime service provider* is also responsible to install and commission the *IVS*.

3.31
regulated/regulatory application
application arrangement using TARV utilised by *jurisdictions* (3.27) for granting certain categories of commercial vehicles rights to operate in regulated circumstances subject to certain conditionsor to permit a vehicle to operate within the *jurisdiction*

Note 1 to entry: It may be mandatory or voluntary at the discretion of the *jurisdiction.*

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3.32
regulated application service
TARV application service to meet the requirements of a regulated application that is mandated by a regulation imposed by a *jurisdiction* (3.27), or is an option supported by a *jurisdiction*

3.33
regulated vehicle
vehicle that is subject to regulations determined by the *jurisdiction* (3.27) as to its use on the road system of the *jurisdiction* in regulated circumstances, subject to certain conditions, and in compliance with specific regulations for that class of regulated vehicle

Note 1 to entry: At the option of *jurisdictions,* this may require the provision of information via TARV or provide the option to do so.

3.34
regime for open application management
ROAM
facilities (3.20) layer for TARV, within the ISO 15638 series of standards, providing an open access, yet secure runtime environment for TARV and other applications, including cooperative vehicle applications, on top of the CALM communications environment

3.35
roadside sensor
device installed at or near the roadside or above the road or embedded into the road that either

a) collects data concerning the vehicle (e.g. licence plate, vehicle speed, vehicle emission data etc.) and passes that data to the vehicle IVS

b) provides other dynamic data to the vehicle IVS (e.g. temporary or permanent speed limits or other restrictions or informative data)

c) requests the IVS to take some action as a result of sensed information

for use in support or execution of a TARV application

3.36
service provider
party which is certified by a *certification authority (regulatory)* (3.12) as suitable to provide regulated or commercial ITS *application services* (3.3)

3.37
session
wireless communication exchange between the *ITS-station* (3.25) of an *IVS* (3.23) and the *ITS-station* of its *application service provider* (3.4) to achieve data update, data provision, upload apps, or otherwise manage the provision of the *application service* (3.3), or a wireless communication provision of data to the *ITS-station* of an *IVS* from any other *ITS-station*

3.38
specification
explicit and detailed description of the nature and functional requirements and minimum performance of equipment, service or a combination of both

3.39
tamper
tampering
conduct towards *IVS* (3.23) or a *service provider's* (3.36) system which is intended to prevent the *IVS* or the *service provider's* system from functioning correctly

3.40
telematics
use of wireless media to obtain and transmit (data) from a distant source

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3.41
Unified Modeling Language
UML
graphical language for visualizing, specifying, constructing, and documenting the artifacts of a software-intensive system

Note 1 to entry: *UML* offers a standard way to write a system's blueprints, including conceptual things such as business processes and system functions as well as concrete things such as programming language statements, database schemas, and reusable software components, and is standardised as ISO/IEC 19501 [Unified Modeling Language (*UML*)].

3.42
user
individual or party that enrols in and operates within a regulated or *commercial application* (3.14) service

EXAMPLE *Driver* (3.19), transport *operator* (3.29), freight owner.

4 Symbols and abbreviated terms

ASD file application service data file

ASP application service provider

CALM communications access for land mobiles

C-ITS cooperative intelligent transport system

CONOPS concept of operations

GNSS global navigation satellite system

HV heavy vehicle

ID identity

ITS-S ITS station

IVS In-vehicle system

LDM local dynamic map

LDT local data tree

RAS regulated application service

RHV regulated heavy vehicle

ROAM regime for open application management

RTM remote tachograph monitoring

TARV telematics applications for regulated vehicles

UML Unified Modeling Language (ISO/IEC 19501)

WIM weigh in motion

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