Draft ISO TARV standard to enable TARV to carry ADR messages

Submitted by the Editor of ISO 15638, ISO TC204 WG7

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2. Relevant information may also be found on the documents which may be accessed at https://www.box.com/s/hr1v1x2f604zvhlz7kvh
Intelligent transport systems — Framework for cooperative telematics applications for regulated commercial freight vehicles (TARV) — Part 18: ADR (Dangerous goods)

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO TS 15638-18 was prepared by Technical Committee ISO/TC 204, Intelligent transport systems, Working Group 7, Freight and Fleet.

This second/third/... edition cancels and replaces the first/second/... edition (ISO nnn-n:19x), [clause(s) / subclause(s) / table(s) / figure(s) / annex(es)] of which [has / have] been technically revised.

ISO 15638 consists of the following parts, under the general title Intelligent transport systems — Framework for cooperative Telematics Applications for Regulated Vehicles (TARV):

— ISO 15638 -1  TARV -Framework and architecture (4.9)
— ISO 15638 -2  TARV -Common platform parameters using CALM
— ISO 15638 -3  Operating requirements, 'Approval Authority' approval procedures, and enforcement provisions for the providers of regulated services
— ISO 15638 -4  TARV -System security requirements
— ISO 15638 -5  TARV – Generic vehicle information
— ISO 15638 -6  TARV -Regulated applications
— ISO 15638 -7  TARV -Other applications
— ISO 15638 -8  TARV -Vehicle access management and monitoring
— ISO 15638 -9  TARV -Remote electronic tachograph monitoring
— ISO 15638 -10  TARV -Emergency messaging system/eCall
— ISO 15638 -11  TARV -Driver work records
— ISO 15638 -12  TARV -Vehicle mass monitoring
— ISO 15638 -13  TARV -Mass penalties and levies
— ISO 15638 -14  TARV -Vehicle access control
— ISO 15638 -15  TARV -Vehicle location monitoring
— ISO 15638 -16  TARV -Vehicle speed monitoring
— ISO 15638 -17  TARV -Consignment and location monitoring
— ISO 15638 -18  TARV -ADR (Dangerous Goods) monitoring (this Part)
— ISO 15638 -19  TARV -Vehicle parking facilities
Introduction

Many ITS technologies have been embraced by commercial transport operators and freight owners, in the areas of fleet management, safety and security. Telematics applications have also been developed for governmental use. Such regulatory services in use or being considered vary from jurisdiction to jurisdiction, but include electronic on-board recorders, digital tachograph, on-board mass monitoring, ‘mass’ penalties and levies, vehicle access methods, hazardous goods tracking and e-call. Additional applications with a regulatory impact being developed include, fatigue management, speed monitoring and heavy vehicle penalties imposed based on location, distance and time.

In such an emerging environment of regulatory and commercial applications, it is timely to consider an overall architecture (business and functional) that could support these functions from a single platform within a commercial freight vehicle that operate within such regulations. International Standards will allow for a speedy development and specification of new applications that build upon the functionality of a generic specification platform. A suite of standards is required to describe and define the framework and requirements so that the on board equipment and back office systems can be commercially designed in an open market to meet common requirements of jurisdictions.

This suite of standards addresses and defines the framework for a range of cooperative telematics ITS service applications for regulated commercial freight vehicles (such as access, driver fatigue management, speed monitoring, on-board mass monitoring, penalties and levies). The overall scope includes the concept of operation, legal and regulatory issues, and the generic cooperative provision of services to regulated commercial freight vehicles, using an on-board ITS platform. The framework is based on a (multiple) service provider oriented approach with provisions for the approval and auditing of service providers.

This suite of standards deliverables will:

- provide the basis for future development of cooperative telematics applications for regulated commercial freight vehicles. Many elements to accomplish this are already available. Existing relevant standards will be referenced, and the specifications will use existing standards (such as CALM) wherever practicable.
- allow for a powerful platform for highly cost-effective delivery of a range of telematics applications for regulated vehicles.
- a business architecture based on a (multiple) service provider oriented approach
- address legal and regulatory aspects for the approval and auditing of service providers.

This suite of standards deliverables is timely as many governments (Europe, North America, Asia and Australia/New Zealand) are considering the use of telematics for a range of regulatory purposes. Ensuring that a single in-vehicle platform can deliver a range of services to both government and industry through open standards and competitive markets is a strategic objective.

This part of the ISO 15638 family of standards deliverables provides specifications for ADR (Dangerous goods). NOTE: The definition of what comprises a ‘regulated’ vehicle is regarded as an issue for National decision, and may vary from jurisdiction to jurisdiction. This suite of standards deliverables does not impose any requirements on nations in respect of how they define a regulated vehicle.

NOTE: The definition of what comprises a ‘regulated’ service is regarded as an issue for National decision, and may vary from jurisdiction to jurisdiction. This suite of standards deliverables does not impose any requirements on nations in respect of which services for regulated vehicles jurisdictions will require, or support as an option, but will provide standardised sets of requirements descriptions for identified services to enable consistent and cost efficient implementations where implemented.
Intelligent transport systems — Framework for cooperative telematics applications for regulated commercial freight vehicles (TARV) — Part 18: ADR (Dangerous goods)

1 Scope
This part of ISO 15638 addresses the provision of ‘ADR (Dangerous goods)’ and specifies the form and content of such data required to support such systems, and access methods (4.1) to that data.

The scope of this part of ISO 15638 is to provide specifications (4.43) for common communications and data exchange aspects of the application service (4.3) ADR (dangerous goods (4.17)) that a regulator (4.39) may elect to require or support as an option, including:

a) High level definition of the service that a service provider (4.41) has to provide. (The service definition describes common service elements; but does not define the detail of how such an application service (4.3) is instantiated, nor the acceptable value ranges of the data concepts defined)

b) Means to realise the service

c) Application data, naming content and quality that an IVS (4.26) has to deliver.

The definition of what comprises a ‘regulated’ service is regarded as an issue for National decision, and may vary from jurisdiction (4.30) to jurisdiction. This deliverable does not impose any requirements on nations in respect of which services for regulated vehicles jurisdictions will require, or support as an option, but provides standardised sets of requirements descriptions for identified services to enable consistent and cost efficient implementations where instantiated.

ISO 15638 has been developed for use in the context of regulated commercial freight vehicles (hereinafter referred to as ‘regulated vehicles’ (4.38)). There is nothing however to prevent a jurisdiction extending or adapting the scope to include other types of regulated vehicles, as it deems appropriate.

2 Conformance
Requirements to demonstrate conformance to any of the general provisions or specific application services (4.3) described in this part of ISO 15638 shall be within the regulations imposed by the jurisdiction (4.30) where they are instantiated. Conformance requirements to meet the provisions of this International Standard are therefore deemed to be under the control of, and to the specification of, the jurisdiction where the application service(s) is/are instantiated.

3 Normative references
The following referenced documents are indispensable for the application 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 15638-1  Intelligent transport systems — Framework for cooperative telematics applications for regulated vehicles (TARV) — Part 1: Framework and architecture

ISO 15638 -2  Intelligent transport systems — Framework for cooperative telematics applications for regulated vehicles (TARV) - Common platform parameters using CALM

ISO 15638 -3  Framework for cooperative telematics applications for regulated vehicles (TARV) — Operating requirements, approval procedures, and enforcement provisions for the providers of regulated services
ISO 15638 -4  Intelligent transport systems – Framework for cooperative telematics applications for regulated vehicles (TARV) – System security requirements

ISO 15638 -5  Intelligent transport systems – Framework for cooperative telematics applications for regulated vehicles (TARV) – General vehicle information

ISO 15638 -6  Intelligent transport systems – Framework for cooperative telematics applications for regulated vehicles (TARV) – Regulated applications

ISO 15638 -17  Intelligent transport systems – Framework for cooperative telematics applications for regulated vehicles (TARV) -Consignment and location monitoring

ISO 15638 -10  Intelligent transport systems – Framework for cooperative telematics applications for regulated vehicles (TARV) -Emergency messaging system/eCall

ISO 15638 -17  Intelligent transport systems – Framework for cooperative telematics applications for regulated vehicles (TARV) -Consignment and location monitoring

4 Terms and definitions
For the purposes of this document, the following terms and definitions apply / the terms and definitions given in ISO 15638-1 and the following apply.

4.1 access methods
procedures and protocols to provision and retrieve data

4.2 app
small (usually) Java™ applets, organised as software bundles, that support application services (4.3) by keeping the data pantry (4.18) provisioned with up to date data

4.3 application service
service provided by a service provider (4.41) enabled by accessing data from the IVS (4.26) of a regulated vehicle (4.38) via a wireless communications network

4.4 application service provider (ASP)
party that provides an application service (4.3)

4.5 app library
separately secure area of memory in IVS (4.26) where apps are stored (with different access controls to data pantry (4.18))

4.6 approval
formal affirmation that an applicant has satisfied all the requirements for appointment as an application service provider (4.4) or that an application service delivers the required service levels

4.7 approval agreement
written agreement made between a approval authority (regulatory) (4.8) and a service provider (4.41)

NOTE A approval authority (regulatory) (4.8) approval agreement recognises the fact that a service provider (4.41), having satisfied the approval authority’s requirements for appointment as a service provider, is appointed in that capacity, and sets out the legal obligations of the parties with respect to the on-going role of the service provider

4.8 approval authority (regulatory)
organisation (usually independent) which conducts approval (4.6) and ongoing audit (4.10) for service providers (4.41) on behalf of a jurisdiction (4.30)
4.9 architecture
formalised description of the design of the structure of TARV and its framework (4.24)

4.10 audit/auditing
review of a party’s capacity to meet, or continue to meet, the initial and ongoing approval agreements (4.7) as a service provider (4.41)

4.11 basic vehicle data
data that shall be maintained/provided by all IVS (4.26) (regardless of jurisdiction (4.30))

4.12 CALM communications access for land mobiles
layered solution that enables continuous or quasi continuous communications between vehicles and the infrastructure, or between vehicles, using such (multiple) wireless telecommunications media that are available in any particular location, and which have the ability to migrate to a different available media where required and where media selection is at the discretion of user (4.46) determined parameters by using a suite of standards based on ISO 21217 (CALM architecture) and ISO21210 (CALM networking) that provide a common platform for a number of standardised media using ITS-stations (4.28) to provide wireless support for applications, such that the application is independent of any particular wireless medium

4.13 commercial application(s)
ITS applications in regulated vehicles (4.38) for commercial (non-regulated) purposes
Example asset tracking, vehicle and engine monitoring, cargo security, driver management etc.

4.14 consignment
shipment of goods/cargo to a destination

4.15 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 (4.28) 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 (4.27)

4.16 core data
basic vehicle data (4.11) plus any additional data required to provide an implemented regulated application service (4.37)

4.17 dangerous goods
substances or articles which are potentially hazardous (for example, poisonous to humans, harmful to the environment, explosive, flammable or radioactive) that require regulatory control when transported

4.18 data pantry
secure area of memory in IVS (4.26) where data values are stored (with different access controls to app library (4.5))

4.19 driver
person driving the regulated vehicle at any specific point in time

4.20
**driver work records** *(DWR)*
collection, collation, and transfer of driver (4.19) work and rest hours data from an in-vehicle system (4.26) to an application service provider (4.4)

4.21
eCall
specialised instantiation of an EMS (4.22) that provides incident messaging and communication with a public service assistance point via priority wireless telephone communications using its emergency call capabilities

4.22
emergency message system (EMS)
collection, collation, and transfer of emergency message data from an in-vehicle system (4.26) to an application service provider (4.4)

4.23
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

4.24
framework
particular set of beliefs, ideas referred to in order to describe a scenario or solve a problem

4.25
hazardous goods/HAZMAT
see dangerous goods (4.32) / Accord européen relatif au transport international des marchandises Dangereuses par Route (ADR) (4.6)

4.26
in-vehicle system (IVS)
ITS-station (4.28) and connected equipment on board a vehicle

4.27
ITS service
communication functionality offered by an ITS-station (4.28) to an ITS-station application

4.28
ITS-station (ITS-s)
entity in a communication network, comprised of application, facilities (4.23), networking and access layer components specified in ISO 21217 that operate within a bounded secure management domain

4.29
Java™
object oriented open source operating language developed by SUN systems

4.30
jurisdiction
government, road or traffic authority which owns the regulatory applications (4.36)
Example country, state, city council, road authority, government department (customs, treasury, transport), etc.

4.31
local data tree *(LDT)*
frequently updated data concept stored in the on-board data pantry (4.18) containing a collection of data values deemed essential for either a) TARV regulated application service (4.37), or b) cooperative intelligent transport systems (4.15)

4.32
mass
mass of a given heavy vehicle as measured by equipment affixed to the regulated vehicle (4.38)

4.33
mass penalties and levies (MPL)
collection, collation, and transfer of vehicle mass (4.32) data from an in-vehicle system (4.26) to an application service provider (4.4) to enable, or as part of a system of, imposing penalties and levies for access (4.1) to/use of specific roads/gates/bridges/tunnels/gates etc. based on the mass of the regulated vehicle (4.38)

4.34
operator
fleet manager of a regulated vehicle

4.35
prime service provider
service provider (4.41) who is the first contractor to provide regulated application services (4.37) to the regulated vehicle (4.38), or a nominated successor on termination of that initial contract; the prime service provider (4.35) is also responsible to maintain the installed IVS (4.26); if the IVS was not installed during the manufacture of the vehicle the prime service provider (4.35) is also responsible to install and commission the IVS (4.26)

4.36
regulated/regulatory application
application arrangement using TARV utilised by jurisdictions (4.30) for granting certain categories of commercial vehicles rights to operate in regulated circumstances subject to certain conditions, or indeed to permit a vehicle to operate within the jurisdiction; may be mandatory or voluntary at the discretion of the jurisdiction

4.37
regulated application service
TARV application service to meet the requirements of a regulated application that is mandated by a regulation imposed by a jurisdiction (4.30), or is an option supported by a jurisdiction

4.38
regulated commercial freight vehicle/regulated vehicle
vehicle that is subject to regulations determined by the jurisdiction (4.30) 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; at the option of jurisdictions; this may require the provision of information via TARV or provide the option to do so

4.39
regulator
agent of the jurisdiction (4.30) appointed to regulate and manage TARV within the domain of the jurisdiction; may or may not be the approval authority (regulatory) (4.8)

4.40
remote tachograph monitoring (RTM)
collection, collation, and transfer of data from an on-board electronic tachograph (4.44) system to an application service provider (4.4)

4.41
service provider
party which is approved by a approval authority (regulatory) (4.8) as suitable to provide regulated or commercial ITS application services (4.3)

4.42 session
wireless communication exchange between the ITS-station (4.28) of an IVS (4.26) and the ITS-station of its application service provider (4.4) to achieve data update, data provision, upload apps, or otherwise manage the provision of the application service (4.3), or a wireless communication provision of data to the ITS-station of an IVS (4.26) from any other ITS-station

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

4.44 tachograph
sender unit mounted to a vehicle gearbox, a tachograph head and a digital driver card, which records the regulated vehicle (4.38) speed and the times at which it was driven and aspects of the driver’s (4.19) activity selected from a choice of modes

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

4.46 user
individual or party that enrols in and operates within a regulated or commercial application (4.13) service (4.3)
Example driver (4.19), transport operator (4.34), freight owner, etc.

4.47 vehicle access control (VAC)
control of regulated vehicles ingress to and egress from controlled areas and associated penalties and levies

4.48 vehicle access management (VAM)
monitoring and management of regulated vehicles approaching or within sensitive and controlled areas

4.49 vehicle location monitoring (VLM)
collection, collation, and transfer of vehicle location data from an in-vehicle system (4.26) to an application service provider (4.4)

4.50 vehicle mass monitoring (VMM)
collection, collation, and transfer of vehicle mass (4.32) data from an in-vehicle system (4.26) to an application service provider (4.4)

4.51 vehicle parking facility (VPF)
system for booking and access (4.1) to and egress from a vehicle parking facility (VPF) (4.68)

4.52 vehicle speed monitoring (VSM)
collection, collation, and transfer of vehicle speed data from an in-vehicle system (4.26) to an application service provider (4.4)
5 Symbols (and abbreviated terms)

ADR
Accord européen relatif au transport international des marchandises Dangereuses par Route (4.6) (dangerous goods (4.17))

ADRm
ADR monitoring

app
applet (JAVA™ application or similar) (4.2)

ASP
application service provider (4.4)

CALM
communications access for land mobiles (4.12)

C-ITS
cooperative intelligent transport systems (4.15)

DLR
driving licence reader

DRD
driver records device

EMS
emergency message system (4.22)

ID
identity

IP
internet protocol

ITS-S
ITS station (4.28)

IVS
In-vehicle system (4.26)

LDT
local data tree (4.31)

MSD
minimum set of data
[eCall (4.21). EN 15722]

OID
object identifier

PSAP
public service answering point

SAD
single administrative document (which accompanies ADR consignments in Europe)

SE
service element

TARV
telematics (4.45) applications for regulated vehicles (4.38)

UML
Unified Modeling Language (4.77) (ISO 19501)

UNECE
United Nations Economic Commission for Europe

URL
uniform resource locator

UTC
coordinated universal time

6. General overview and framework requirements

ISO TS 15638-1 provided a framework (4.24) and architecture (4.9) for TARV. It provided a general description of the roles of the actors in TARV and their relationships. To understand clearly the TARV framework, architecture (4.9) and detail and specification (4.43) of the roles of the actors involved, the reader is referred to ISO TS 15638-1. ISO TS 15638-6 provides the core requirements for all regulated applications. To understand clearly the general context in to which the provision of this application service, the reader is referred to ISO TS 15638-6.

In order to be compliant with this part of ISO 15638, the overall architecture employed shall comply to ISO 15638-1.
In order to be compliant with this part of ISO 15638, the communications employed shall comply to ISO 15638-2.
In order to be compliant with this part of ISO 15638, the operating requirements employed shall comply to ISO 15638-3.
In order to be compliant with this part of ISO 15638, the security employed shall comply to ISO 15638-4.
In order to be compliant with this part of ISO 15638, the basic vehicle data shall comply to ISO 15638-5.

ISO 15638 has been developed for use in the context of regulated commercial freight vehicles. There is nothing however to prevent a jurisdiction extending or adapting the scope to include other types of regulated vehicles, as it deems appropriate.

7. Requirements for services using generic vehicle data

The means by which the access commands for generic vehicle information specified in ISO 15638-5 can be used to provide all or part of the data required in order to support a regulated application service (4.37) shall be as defined in ISO 15638-6.

8. Application services that require data in addition to basic vehicle data

8.1 General
Shall be conducted as defined in ISO 15638-6.

8.2 Quality of service requirements
This part of ISO 15638 contains no general requirements concerning quality of service. Such aspects shall be determined by a jurisdiction (4.30) as part of its specification (4.43) for any particular regulated application service (4.37). However, where a specified regulated application service (4.37) has specific Q of S requirements essential to maintain interoperability, these aspects shall be as specified in Clause 10.

8.3 Test requirements
This part of ISO 15638 contains no general requirements concerning test requirements. Such aspects shall be determined by a jurisdiction (4.30) as part of its specification (4.43) for any particular regulated application service (4.37), and issued as a formal test requirements specification document. However, where a specified regulated application service (4.37) has specific test requirements essential to maintain interoperability, these aspects shall be as specified in Clause 10 relating to this regulated application service, or in a separate standards deliverable referenced within that Clause. And where multiple jurisdictions recognise a benefit to common test procedures for a specific regulated application service, this shall be the subject of a separate standards deliverable.

8.4 Marking, labelling and packaging
This part of ISO 15638 has no specific requirements for marking labelling or packaging. However, where the privacy of an individual may be potentially or actually compromised by any instantiation based on the ISO 15638 family of Standards, the contracting parties shall make such risk explicitly known to the implementing jurisdiction (4.30) and shall abide by the privacy laws and regulations of the implementing jurisdiction and shall mark up or label any contracts specifically and explicitly drawing attention to any loss of privacy and precautions taken to protect privacy. Attention is drawn to ISO TR 12859 in this respect.

9. Common features of regulated TARV application services
9.1 General
The details of the instantiation of regulated application service (4.37) are as designed by the application service system to meet the requirements of a particular jurisdiction (4.30) and are not defined herein. ISO 15638-6 specifies the generic roles and responsibilities of actors in the systems, and instantiations that claim compliance with this part of ISO 15638 shall also be compliant with the requirements of ISO 15638-6.

The means by which data is provisioned into the data pantry (4.18), and the means to obtain the TARV LDT (4.31) and core data (4.16) are described in Clause 8 of ISO 15638-6.

In order to minimise demand on the IVS (4.26) (which it is assumed will be performing multiple application services (4.3) simultaneously, as well as supporting general safety related cooperative ITS systems), and because national requirements and system offerings will differ, a ‘cloud’ approach has been taken in defining TARV regulated application services (4.37).

The TARV approach is for the on-board app (4.2) supporting the application service to collect and collate the relevant data, and at intervals determined by the app, or on demand from the application service provider (4.4) (ASP), pass that data to the ASP. All of the actual application service processing shall occur in the mainframe system of the ASP (in the ‘cloud’).

For further information see Clause 9 of ISO 15638-6.

At a conceptual level, The TARV system is therefore essentially simple, as shown in Figure 1. The process is similar to that for CoreData, but data is supplied to a different on-board file in the data pantry (4.18).
Figure 1 — TARV Regulated application service on-board procedure

At a common generic functional level for this application service, the process may be seen as shown in Figure 2 below, however the connected equipment may/may not be required in all cases.

9.2 Common role of the jurisdiction, approval authority, service provider and user.
The Common role of the jurisdiction, approval authority, application service provider and user shall be as defined in ISO 15638-6.

9.3 Common characteristics for instantiations of regulated application services
The common characteristics for instantiations of regulated application services shall be as defined in ISO 15638-6.

9.4 Common sequence of operations for regulated application services
The Common sequence of operations for regulated application services shall be as defined in ISO 15638-6.

9.5 Quality of service
Generic quality of service provisions for application services (4.3) shall be as defined in ISO 15638-6.

9.6 Information security
Information security shall be as defined in ISO 15638-6.

9.7 Data naming content and quality
Data naming and quality shall be as defined in ISO 15638-6

9.8 Software engineering quality systems
Software engineering quality systems shall be as defined in ISO 15638-6.

9.9 Quality monitoring station
The availability of Quality monitoring stations shall be as defined in ISO 15638-6.
9.10 Audits
Audits shall be as defined in ISO 15638-6.

9.11 Data access control policy
To protect the data and information held by the application service provider (4.4), each provider shall adopt a risk based data access control policy for employees of the provider.

9.12 Approval of IVSs and service providers
Generic provisions for the approval (4.6) of IVSs and service providers (4.41) shall be as specified in ISO 15638-3 (TARV –Operating requirements, approval procedures, and enforcement provisions for the providers of regulated services). Detailed provisions for specific regulated applications (4.36) shall be as specified by the regime of the jurisdiction (4.30).

10. TARV ADR consignment monitoring (ADRm)
10.1 ADRm service description and scope
NOTE: The content of this section, while remaining under ISO TC204 control, is being shared with UNECE JWG RID for improvement and harmonisation. We are scheduled to meet with UNECE JWG RID later in 2012 to hopefully develop a harmonised version, and are working with its consultants in the meantime to achieve this goal.
NOTE: ADR is a requirement in Europe and other countries, it is not a global requirement, other clauses, or Parts of ISO 15638 for similar measures will be constructed, if ISO 15638-10 (TARV Emergency message service/eCall) or ISO 15638-17 (TARV Consignment location monitoring) are unable to accommodate them within the existing specifications (4.43). This part of ISO 15638 (Part 18) is specified separately because it makes specific reference to very specific provisions for ADR required in nearly 50 countries and UN ECE has requested that, in addition to emergency messaging, we make, if possible, provision for their non-emergency requirements to be accommodated within TARV.

10.1.1 ADRm use case
10.1.2 Description of ADRm regulated application service
This application service uses the wireless link between the on-board ITS-station (4.28) (in-vehicle platform) and an application service provider (4.4), in order to convey an ADR (Accord européen relatif au transport international des marchandises Dangereuses par Route) (4.6), otherwise known as ‘dangerous goods (4.17) or ‘HAZMAT (4.25)’ consignment (4.14), data from the regulated vehicle (4.38) to an ADRm application service provider. See Figure 2.

This use case covers data to be sent in the normal course of business where ADR (4.6) consignment monitoring is required. In respect of ADR emergency messages, refer to ISO 15638-10 (TARV Emergency message system/eCall). The content of any message shall adhere to the requirements of the regulations in force in that jurisdiction (4.30), or shall follow the data content defined herein.

10.2 Concept of operations for ADRm
10.2.1 General
**ADR consignments** (4.14) are the subject of special regulation. In most jurisdictions (4.30), significant paperwork is processed through the administration system, and has to accompany the regulated vehicle (4.38) throughout its journey.

As a step towards paperless management it is the goal of UNECE JWG RID to encourage and define means of paperless access to data required in the management of ADR cargos. For information required to be supplied to PSAPs/emergency responders in response to an incident, see ISO 15638-10 (TARV Emergency message system/eCall).

The majority of access to information is required as part of routine (non-emergency) situations. This Part of ISO 15638 specifies how this information can be provided using TARV.

### 10.2.2 Statement of the goals and objectives of ADRm

The objective of the system is to provide legitimate interested parties with key information concerning the regulated vehicle (4.38) and its consignment (4.14), to support ADR regulations together with other key data, as implemented by jurisdictions (4.30).

**NOTE:** UNECE JWG RID are currently reviewing their reference pointers to ADR information, and this Part of ISO 15638 and its table(s) will be revised if material change is made.

### 10.2.3 Strategies, tactics, policies, and constraints affecting ADRm

The points of demand for ADRm data will vary from jurisdiction (4.30) to jurisdiction, so the nexus of this service is the provision of data from the regulated vehicle (4.38) to a landside application service provider (4.4) who will know who provide it to, when, and in what format. Those conditions and requirements are not specified in this part of ISO 15638, but left to jurisdictions to determine and regulate at their discretion, or UNECE or other regulator (4.39) to determine and regulate.

The architectural concept is the provision of ADRm data to legitimate enquirers, via an application service provider (4.4). The IVS (4.26) shall provide the data that its on-board ADRm app (4.2) requires, sending that data to the predetermined IPv6 address of the application service provider, via the ITS-station (4.28) of the IVS.

The required data may be entirely collated and stored on-board the regulated vehicle (4.38), or may be a combination of information provisioned on-board the regulated vehicle together with information held in the database of the application service provider (4.4) (for example the TARV LDT (4.31) data from the regulated vehicle and the consignment Note/SAD/Customs data from the application service provider database). Apart from the TARV LDT, a service provider may provide all of the current trip consignment (4.14) data from its own database, or a pointer to a database where it may be obtained (for example one maintained by the operator (4.34)), or may store some or all of the current consignment (4.14) data in the IVS (4.26) of the regulated vehicle (4.38) and contribute the shortfall from its central database or provide a pointer to a database where it may be obtained (for example one maintained by the operator (4.34)) obtained from the regulated vehicle (4.38) IVS.

Architecturally, consistent with other TARV applications, for reasons of security, a direct and targeted enquiry for data from a particular vehicle shall be acknowledged, the communication session (4.42) closed, and a new communication session (4.42) opened to a predetermined IPv6 address stored in the data pantry (4.18) or app library (4.5) of the IVS (4.26), and the data sent to that address.

A legitimate enquirer (for example the enforcement office of a jurisdiction (4.30), insurer, police department, customs etc.), may request ADR data by one or more of several options

a) By direct enquiry to the originator of a consignment note or SAD  
b) By broadcast to vehicles entering its territory or a specific location point in that territory  
c) By direct enquiry to a passing vehicle  
d) By a pre-programmed instruction

In the case of
(a) By direct enquiry to the originator of a consignment note or SAD

The application service provider (4.4), on receiving the request, shall, using a communication session (4.42) between its ITS-station (4.28) and the ITS-station on-board the regulated vehicle (4.38) IVS (4.26), request an update of any predetermined data held in the data pantry (4.18) of the regulated vehicle, and current vehicle status as determined by the enquiry to the regulated vehicle. The regulated vehicle shall respond by passing its data to the application service provider together with a requested final destination address(es) for the data. It is the responsibility of the application service provider to ascertain that the final destination address is genuine, and the means by which they do this are not specified in this part of ISO 15638.

(b) By broadcast to vehicles entering its territory or a specific location point in that territory

The ITS-station (4.28) on board the regulated vehicle (4.38) IVS (4.26), on receiving the broadcast request, shall process an update of any predetermined data held in the data pantry (4.18) of the regulated vehicle, and current vehicle status as determined by the enquiry to the regulated vehicle. The regulated vehicle (4.38) IVS shall respond by passing its data to its application service provider (4.4) together with the requested final destination address(es) for the data. It is the responsibility of the application service provider to ascertain that the final destination address is genuine, and the means by which they do this are not specified in this part of ISO 15638.

(c) By direct enquiry to a passing vehicle or ITS-station (4.28)

The ITS-station (4.28) on board the regulated vehicle (4.38) IVS (4.26), on receiving the direct request from an apparently genuine ITS-station (usually infrastructure based ITS-station, or a portable ITS-station in the hands of an authorised officer of the jurisdiction (4.30)), shall process an update of any predetermined data held in the data pantry (4.18) of the regulated vehicle, and current vehicle status as determined by the enquiry to the regulated vehicle. The regulated vehicle IVS shall respond by passing its data to its application service provider (4.4) together with the requested final destination address(es) for the data. It is the responsibility of the application service provider to ascertain that the final destination address is genuine, and the means by which they do this are not specified in this part of ISO 15638. The form of direct interrogation request for ADR data is defined in ISO 15638-6 Clause 7 as ‘GETADR’. See ISO 15638-6 for detail.

(d) By pre-programmed instruction

The ITS-station (4.28) on board the regulated vehicle (4.38) IVS (4.26), as a result of an instruction within the ADRm app (4.2) in the on-board applications library, or triggered by some event such as timing, or an alarm, shall process an update of any predetermined data held in the data pantry (4.18) of the regulated vehicle. The regulated vehicle (4.38) IVS shall respond by passing its data to its application service provider (4.4). It is the responsibility of the application service provider to ascertain the appropriate final destination address, and the means by which they do this are not specified in this part of ISO 15638.

10.2.4 Organisations, activities, and interactions among participants and stakeholders in ADRm

The interrogator shall be an app (4.2) in the library of the IVS (4.26), or the receipt of a message from an ITS-station (4.28) within communications range (for example a roadside ITS-station) or any interrogator deemed appropriate by the contract between the user (4.46) and the application service provider (4.4).

The prime service provider (4.35) is the actor who is responsible to install and maintain the ADR consignment (4.14) data monitoring equipment and its triggering mechanism in the regulated vehicle (4.38).

The application service provider (4.4) is the party who contracts with the user (4.46) to provide the ADRm service.

The user (4.46) is the regulated vehicle (4.38) operator (4.34) and his driver (4.19).
## 10.2.5 Clear statement of responsibilities and authorities delegated for ADRm

### Table 1 — TARV: ADRm actors involved, their activities and interactions

<table>
<thead>
<tr>
<th>ACTOR ROLE</th>
<th>ACTIVITIES</th>
<th>INTERACTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>UNECE JWG RID</strong></td>
<td>ADR Regulator</td>
<td>Provides international regulations and ADR Tables</td>
</tr>
<tr>
<td><strong>Jurisdiction (J) (4.30)</strong></td>
<td>Sets requirements for mandatory and supported ADRm</td>
<td>Publishes specifications (4.43)</td>
</tr>
<tr>
<td><strong>Approval authority (CA) (4.8)</strong></td>
<td>Implements jurisdiction policy at equipment and service approval level</td>
<td>Approves IVS (4.26), Application Service (4.3) instantiations</td>
</tr>
<tr>
<td><strong>Prime service provider (PSP) (4.35)</strong></td>
<td>Responsibility for IVS</td>
<td>Installs and/or commissions IVS</td>
</tr>
<tr>
<td><strong>Application service provider (ASP) (4.4)</strong></td>
<td>Provides ADRm application service</td>
<td>Develops instantiation of ADRm application service</td>
</tr>
<tr>
<td><strong>Driver (Dr) (4.19)</strong></td>
<td>Drives regulated vehicle to instruction of operator (4.34)</td>
<td>Drives regulated vehicle</td>
</tr>
</tbody>
</table>

The **prime service provider** (4.35) is responsible to properly install and maintain the equipment which triggers the application service (4.3).

The **regulated vehicle** (4.38) **operator** (4.34) (or owner) commissions the service and contracts with the **application service provider** (4.4), and possibly the **prime service provider** (4.35) (although that may be a subcontract of the application service contract with the **application service provider**).

### 10.2.6 Operational processes for the ADRm

An ‘App’ on-board the **regulated vehicle** (4.38), or one of the legitimate enquirers defined in 10.2.3, generates a trigger for the supply of ADRm information via the **IVS** (4.26) **ITS-station** (4.28).
The *in-vehicle system* (4.26) uses its *ITS-station* (4.28) to send the *ADRm message* and such of its associated data maintained on-board to a predetermined IPv6 address provided by the *application service provider* (4.4), together with the requested final destination address proved by the enquirer.

The *application service provider* (4.4) validates the requested final destination address, and if valid, completes the instantiation of the data concept from its own database and then provides the *ADRm data* to the legitimate enquirer.

10.2.7 Role of ADRm service provider
The *prime service provider* (4.35) installs and maintains the *ADRm consignment* (4.14) data system and its triggering mechanism in the *regulated vehicle* (4.38).

The *application service provider* (4.4) contracts with the *user* (4.46) to provide the *ADRm application service* (4.3).

10.2.8 Role of ADRm user
The *user* (4.46) (operator (4.34) + driver (4.19)) are contracting parties to the service, either by choice or regulation.

The *operator* (4.34) contracts with the *application service provider* (4.4) to provide the service and pays any appropriate fees to the *application service provider*.

The *application service provider* (4.4) may maintain a website (IPv6 address) where data relating to the *consignment* (4.14) is made available.

The *user* (4.46) (operator (4.34)) may maintain a website (IPv6 address) where data relating to the *consignment* (4.14) is made available.

The *user* (4.46) (operator (4.34)) may maintain a telephone hotline where data relating to the *consignment* (4.14) is made available.

10.5 Sequence of operations for ADRm
The sequence of operations in respect of general *ADRm* shall be as shown in Figure 3.
10.6 ADRm naming content and quality
The process to obtain basic vehicle data (4.11) (TARV LDT (4.31)) data content shall be as defined in 8.3 of ISO 15638-6 and ISO 15638-5.

10.7 Specific ADRm data naming content and quality
ADR consignment (4.14) data shall be determined as required by regulations of the jurisdiction (4.30) or UNECE JWG RID. The format and content shall be as defined in the regulations pertaining, or the subject of a written agreement between the parties. However, for consistency, interpretation and data reuse, wherever the following data concept elements are used they shall be represented as defined in Clause 10.9, Table 2.
10.8 ADRm service elements
The service elements for ADR monitoring shall be as defined in the following subClauses:

10.8.1 ADRm SE1: Establish jurisdiction regulations or system specification for ADR monitoring
The jurisdiction (4.30) shall be responsible to define its requirements for its variant of the ADRm application service (4.3), obtain any legislation and/or regulations, and define the procedure for an application service provider (4.4) to gain approval for its instantiation of the ADRm application service.

10.8.2 ADRm SE2: Request system approval
The application service provider (4.4) shall seek approval for its instantiation of the ADRm application service (4.3) from the approval authority (regulatory) (4.8) in accordance with the regime established by the jurisdiction (4.30).

10.8.3 ADRm SE3: User (operator) contracts with prime service provider
It is a prerequisite for any potential vehicle operator (4.34) opting or being required to sign up for the ADRm application service that its regulated vehicles (4.38) are TARV equipped with a TARV compliant IVS (4.26) at point of manufacture or installed by a prime service provider (4.35), and that there is a maintenance contract with a prime service provider for that equipment. (See ISO 15638-1 TARV framework and architecture).

10.8.4 ADRm SE4: User (operator) equips vehicle with a means to provide consignment data
10.8.4.1 It is a prerequisite for any potential vehicle operator (4.34) opting or being required to sign up for the ADRm application service that its regulated vehicles (4.38) are equipped to provide the consignment (4.14) data required. If the data is provided via an IPv6 link to a website, no further data is required, but may optionally be provided as backup.

10.8.4.2 If the jurisdiction (4.30) or UNECE has specified the required data it shall be provided to the requirement of the jurisdiction or UNECE as appropriate, or otherwise as agreed between the operator and the ADRm application service provider (4.4), who may choose to maintain some or all of the information in its application service (4.3) system (rather than on-board the regulated vehicle).

10.8.4.3 The ADRm data concept elements agreed with UNECE (*in process) are provided in Table 2 below.

10.8.4.4 It is further required that there is a maintenance contract with an approved service provider (4.41) for any equipment required to be installed in the regulated vehicle. That service provider shall be, or shall be considered as an agent of, the prime service provider (4.35) in respect of the provisions of this part of ISO 15638.

10.8.5 ADRm SE5: User contracts with application service provider
The user (4.46) (operator (4.34)) shall contract with an application service provider (4.4) who offers an approved ADRm application service to provide the ADRm application service to nominated vehicles.

10.8.6 ADRm SE6: Application service provider uploads software into the TARV equipped vehicles of the operator
The service provider shall upload and commission the on-board ADRm app (4.2) software into the TARV equipped regulated vehicles (4.38) of the operator (4.34).

10.8.7 ADRm SE7: Recording of vehicle consignment data
The on-board ADRm app (4.2) shall create a file, type :ADR [ADR file] within this specification (4.43), named

<ADR><YYMDDhhmm><vehicle registration number>

Prior to the commencement of each journey, the application service provider (4.4) shall establish a communications session (4.42) with the in-vehicle system (4.26) and update the data content of the ADR file with one of the following options (in order of precedence):

a) current consignment data (or url link address to that data) as required by the jurisdiction (4.30),
b) current consignment (or url link address to that data) as required by UNECE,
c) current consignment data (or url link address to that data) as required by the contract between the application service provider (4.4) and the user (4.46)

d) a combination of the TARV LDT (4.31) data and the consignment data determined in Table 2 below (as far as it is available, with padded null fields where a data concept element data is not available or not required)

At the start of each journey the ADRm app (4.2) held in the library of the IVS (4.26) shall be initiated.

During the journey the on-board ADRm app (4.2) in the IVS (4.26) shall update the ADRm file with the following data

<VIS ID>,<VehicleLocation>,<ConsignmentData>
<VIS ID>
<end>

NOTE ISO 15638-5 Clause 9.2.4 definition of location includes location, UTC time and direction of travel

Vehicle direction of travel shall be calculated as specified in ISO 15638-5 Clause 8.3.12

10.8.8 ADRm SE8: ADRm Trigger
The points of demand for ADRm data will vary from jurisdiction (4.30) to jurisdiction, or requirements of UNECE regulation, or requirements of the contract between the operator (4.34) and the application service provider (4.4). Those conditions and requirements are not specified in this part of ISO 15638, but leave to jurisdictions to determine and regulate at their discretion, or UNECE or other regulator (4.39) to determine and regulate. The generation of and submission to the application service provider of ADRm data may be as a result of an instruction within the ADRm app (4.2) in the on-board applications library, or may be triggered by some event such as timing, an alarm, or by interrogation (e.g. spot check) from another ITS-station (4.28).

In the event that, from whatever cause, during the journey, an ADRm consignment (4.14) data request is received, the following SEs shall ensue,

10.8.9 ADRm SE9: Contact predetermined IPv6 address
The IVS (4.26) shall then use the on-board ITS-station (4.28) to contact an ITS-station of the application service provider (4.4) to deliver the ADRm consignment (4.14) data, together with the enquirer’s identification and requested destination, to the predetermined IPv6 address.

NOTE: In the TARV system, for security reasons, to prevent spoofing, phishing and other illegitimate demands for data, data is never provided directly to an enquirer/interrogator, but is always sent to a predetermined IPv6 address of the application service provider (4.4), who is then responsible to ascertain that it is a legitimate enquirer, and then takes responsibility to get the data promptly to the legitimate enquirer. As the identification of legitimate enquirers and their destination IPv6 address is normally known in advance (in this use case it is likely to be police, customs, agent of jurisdiction (4.30), haulier, depot, consignment agent, emergency service responder, etc.), this process will usually be automatic/semi-automatic against maintained check lists, and will normally add only a few seconds to the time when the legitimate enquirer receives the requested data

The IVS (4.26) shall also write a log of the event and associated data into the memory of the IVS as a record of the request.

10.8.10 ADRm SE10: Obtain consignment data
The application service provider (4.4) shall then contact the predetermined IPv6 address to obtain full detail of the consignment (4.14) and any associated ADR data where appropriate.

10.8.11 ADRm SE11: ‘Interrogated’ request for ADR data

10.8.11.1 An interrogating ITS-station shall request ADR specific data as determined in ISO15638-6 clauses 7.1 and 8.1.2.
10.8.11.2 In the event that the IVS of a vehicle receives a wireless interrogation requesting the ADR data, the interrogator shall also provide at the time of the request, a unique 8 byte reference number (URef), and a destination IPv6 address (ReqDest) where it requests the data to be sent.

10.8.11.3 On receipt of the request the IVS shall acknowledge the request with the appropriate ACKnowledgement defined in 8.3.5 of ISO15638-6, <Y>, which acknowledges that a request for ADR data has been received.

10.8.11.4 The IVS shall then close the communication session.

10.8.11.5 The IVS shall then open a new communication session using an available and appropriate CALM wireless medium.

10.8.11.6 The IVS shall then send the ADR datafile (as defined in 10.9) to a predetermined destination IPv6 (internet) address that has previously been stored in the memory of the data pantry by its ASP, together with the URef and ReqDest provided by the interrogator.

10.8.11.7 On successful receipt of the data, the recipient at the predetermined destination IPv6 address shall send an acknowledgement <ADX> to the IVS.

10.8.11.8 On receipt of the acknowledgement <ADX> the IVS shall close its communication session.

10.8.11.9 The ASP shall be responsible to verify that the interrogation is legitimate, appropriate and from an accepted source, and having verified this, shall be responsible to send the data to the interrogator requested IPv6 address. The means and detail of how this is achieved is outside the scope of this part of ISO 15638.

The application service provider (4.4), having ascertained the validity of the enquirer (this process will usually be automatic/semi-automatic against maintained check lists), shall then contact the enquirer in the agreed format (usually an IPv6 address or email address) as provided by the enquirer, providing the ADRm data to the enquirer. The means by which this is achieved is a matter for agreement between the parties and is out with the scope of this part of ISO 15638. The ADRm system of the application service provider (4.4) shall also write a log of the event and associated data into the memory of the backup/archive of the application service provider as a record of the incident for audit trail purposes.

10.8.12 ADRm SE12: Notification to operator
The application service provider (4.4) shall then contact the operator (4.34) to notify them of the enquiry, providing the ADRm data supplied, and enquirers address details to the operator.

10.9 ADRm access methods to provision and retrieve data

The process to obtain basic vehicle data (4.11) (TARV LDT (4.31)) data content shall be as defined in 8.3 of ISO 15638-6 and ISO 15638-5.

The electronic records declared and stored by the IVS (4.26) shall be authenticated, have integrity and be secure from interception or corruption, in accordance with ISO 15638-4.

Consignment (4.14) data shall be provided before the journey commences to the application service provider (4.4), normally by electronic means, and the application service provider shall be responsible to provision any data required into the data pantry (4.18) of the in-vehicle system (4.26) via the ITS-station (4.28) of the IVS (4.26).

The format and content shall be the subject of a written agreement between the parties. However, for consistency, interpretation and data reuse, wherever the following data concept elements are used they shall be represented as defined in Table 2.

NOTE: UNECE JWG RID are currently reviewing their reference pointers to ADR information, and this table will be revised if material change is made.
### Table 2 — ADRm consignment data

<table>
<thead>
<tr>
<th>FILE TYPE</th>
<th>Format of file name</th>
<th>Notes/Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLM</td>
<td>Mandatory &lt;CLM&gt;&lt;YYMMDD&gt;&lt;hhmmss&gt;&lt;vehicle registration number&gt; Example CLM110316 070603 KV76WRR As: CLM110316 070603KV76WRR</td>
<td>Clause 19.4.7 (Vehicle/Location/Consignment monitoring file [CLM file])</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number</th>
<th>Data concept name</th>
<th>Use</th>
<th>Format</th>
<th>Notes/Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADRm-0000</td>
<td>IVS ID</td>
<td>Mandatory</td>
<td>AN (9)</td>
<td>IVS identifier as defined in ISO 15638-5</td>
</tr>
<tr>
<td><strong>ADRm Data Concept element reference</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ADRm-0001</td>
<td>OID</td>
<td>Integer</td>
<td>1 byte</td>
<td>ADRm data concept identifier binary value 1000010 identifying ADRm Schema A (until allocated a revised OID from a central register)</td>
</tr>
<tr>
<td>ADRm-0002</td>
<td>ID</td>
<td>Integer</td>
<td>1 byte</td>
<td>ADRm Schema A data concept format version set to 1 to discriminate from later ADRm Schema A data concept formats Later versions to be backwards compatible with existing versions. Systems receiving an ADRm Schema A data concept to support all standardised ADRm Schema A data concept versions, which are each uniquely identified using an ADRm Schema A data concept format version parameter which will always be contained in the first byte of all [current and future] ADRm Schema A Data concept versions.</td>
</tr>
<tr>
<td>ADRm-0003</td>
<td>Tanker or other vehicle type plus number of dangerous goods on-board</td>
<td>Octet string (1 Byte)</td>
<td>Binary</td>
<td>00000000-11111111 The first binary position of the octet to indicate whether the affected vehicle is a tanker or other type of vehicle where 1nnnnn = Tanker 0nnnnn = Other type of vehicle The remaining 7 binary positions of the octet to identify the number of types of dangerous goods being carried Seven binary bits.</td>
</tr>
<tr>
<td><strong>ADRm-0004</strong></td>
<td><strong>ADR Consignment reference</strong></td>
<td>Binary 3 Octets</td>
<td>Consignors unique reference number expressed as a binary value between 0 – 16,777,215</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td><strong>ADRm-0005</strong></td>
<td><strong>ADR data address URL (information endpoint)</strong></td>
<td>Octet string 35 bytes</td>
<td>An IPv6 URL to a website containing the full UNECE Consignment note details.</td>
<td></td>
</tr>
</tbody>
</table>

- **x000000 = no ADR goods on board**
- **x1111111 = mixed load (unspecified number of types of dangerous goods present on-board, but number unknown)**
- **x1111110 = more than 120 types of ADR goods on-board**
- **x0000001 – x1111100 = 1 – 124 decimal expressed as binary range:**
  - 0 000000-1 111111
  - Concatenated as octet within range:
    - 00000000 – 11111111

The information endpoint to be contacted and respond in a standardized* way using an access to a standardized method to retrieve data, *the standardized way this is done is set elsewhere and is outside of the scope of this deliverable.

Data at that website to provide at a minimum:
- As specified in Chapter 5.4 of ADR. The key requirements are that the documentation
contains the following information (5.4.1.1):
- The UN Number
- Proper shipping name
- Class (with subsidiary hazard, if any, in brackets)
- Packing group (where assigned)
- Number and description of packages
- Total quantity of each item of different UN Number
- Name/address of consignor
- Name/address of consignee(s).
Where there are multiple consignees not known at the start of the journey, the words "Delivery Sale" may be used.
- Declaration relating to any special agreement, where applicable (uncommon)
- Where assigned, the tunnel code, except where it is known that the journey will not involve passing through a relevant tunnel.

If ADRm-0001 - ADRm-0005 data is supplied, no other information is required, but may be provided as backup.

If ADRm—0005 data is not supplied the following data concept elements are mandatory

<table>
<thead>
<tr>
<th>ADRm-0005</th>
<th>UN unambiguous identifier of hazardous goods</th>
<th>Integer (8 octets)</th>
<th>00000 000</th>
</tr>
</thead>
</table>

Up to 10 ADR materials (most dangerous (based on response code), within same response code prioritised to most impact in fire or largest volume) semantically identified as:

*1 UN ECE unique unambiguous identifier to a specific line of the UNECE Economic Commission for Europe, Committee on Inland Transport, European Agreement Concerning the International Carriage of Dangerous Goods by Road: ADR (Accord européen relatif au transport international des marchandises dangereuses par route)
des marchandises dangereuses par Route: Annex A: General provisions and provisions concerning dangerous articles and substances: Part 3

Dangerous goods list, special provisions and exemptions related to limited and excepted quantities

This unambiguous one time identifier is currently under development by UNECE, and is more specific than just the ADR number currently in use

*2 quantity in tonnes or 1000 cubic metres; gross mass/net mass;

Signed magnitude is used in the first of these binary places, to indicate 1=gross mass, 0=net mass

Each integer therefore comprises

00000 x00; (where x= signed magnitude of 0 or1)

Concatenated as

as

00000x00, 00000x00, 00000x00, 00000x00,

00000x00, 00000x00, 00000x00, 00000x00,

00000x00, 00000x00, 00000x00, 00000x00,

00000x00, 00000x00, 00000x00, 00000x00,

00000x00, 00000x00, 00000x00, 00000x00,

Or

00000x00000000000000000000000000
0x00000000000000000000000000000000
00000x00000000000000000000000000
0x00000000000000000000000000000000
00000x00

No/no more Hazardous goods identified by

‘00000000’

### ADRm-0006

**Alarm information**

<table>
<thead>
<tr>
<th>Octet string (1 Byte)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any alarm information from on-board sensors (pressure, leakage, shock, temperature etc)</td>
</tr>
<tr>
<td>Binary Flag 0 = no alarm</td>
</tr>
<tr>
<td>1 = alarm</td>
</tr>
<tr>
<td>00000000</td>
</tr>
<tr>
<td>Binary position</td>
</tr>
<tr>
<td>L F T S P O R1 Z</td>
</tr>
<tr>
<td>L = Leakage alarm</td>
</tr>
<tr>
<td>F = Fire alarm</td>
</tr>
<tr>
<td>T = Temperature alarm</td>
</tr>
<tr>
<td>S = Shock alarm</td>
</tr>
<tr>
<td>P = Pressure alarm</td>
</tr>
<tr>
<td>O = Orientation alarm</td>
</tr>
<tr>
<td>R1 = reserved for future use</td>
</tr>
<tr>
<td>Z = Other alarm</td>
</tr>
</tbody>
</table>

**IMPORTANT NOTE:** Emergency services need to be aware that the absence of an alarm indicates only that there was no alarm showing as activated at the time of compiling the data. Alarms raised post the population of/sending of the ADRm data will not be transmitted. These codes therefore only indicate status before or at the point of the incident, and cannot be taken as the current status post incident.

### ADRm-0007

**IVS ID**

| Mandatory |
| AN (9) |
| IVS identifier as defined in ISO 15638-5 (to indicate end of consignment data, as this data will vary from journey to journey) |

In the event that data is sent in response to an interrogation requesting data, the following data shall be appended:

<table>
<thead>
<tr>
<th>Number</th>
<th>Data concept name</th>
<th>Use</th>
<th>Format</th>
<th>Notes/Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADRm-0008</td>
<td>Uref</td>
<td>Mandatory</td>
<td>AN (8)</td>
<td>An 8 byte reference provided by the interrogator requesting the data. The alphanumeric or binary content of which is unspecified by ISO 15638, but is intended to be used by the interrogator to provide a unique reference to its request for data</td>
</tr>
</tbody>
</table>
20.9 ADRm application service specific provisions for quality of service

Shall be at the determination of UNECE.

The integrity of the data is important, and other sensors as well as parameters may then be required based on the approaches and techniques used to provide assurance of the quality of the data. The generic quality of service provisions that are specified in 10.4 are defined in ISO 15638-6 and ISO 15638-5.

Instantiation specific requirements shall be part of the regulation of the jurisdiction (4.30). However, in defining such requirements jurisdictions shall wherever possible, use performance based or functionally specifications (4.43) in order to avoid locking requirements into technologies that will become obsolete.

NOTE: Having prescribed integrity and its parameters into an operational system, it is harder to move to other integrity indicators when new technologies come along.

See also Clause 9 above for general quality of service requirements.

20.10 ADRm application service specific provisions for test requirements

t.b.d.(by UNECE)

10.12 ADRm application specific rules for the approval of IVSs and ‘Service Providers’

As 9.12.

11. Declaration of patents and intellectual property

This part of ISO 15638 contains no known patents or intellectual property other than that which is implicit in the media standards referenced herein and in ISO 15638-2. While the CALM standards themselves are free of patents and intellectual property, CALM in many cases relies on the use of public networks and IPR exists in many of the public network media standards. The reader is referred to those standards for the implication of any patents and intellectual property.

Application services (4.3) specified within this part of ISO 15638 and ISO 15638-7 contain no direct patents nor intellectual property other than the copyright of ISO. However, national, regional or local instantiations of any the applications services defined in this part of ISO 15638 and ISO 15638-7, or of the generic vehicle information defined in ISO 15638-5, the security requirements contained in ISO 15638-4, or the requirements of ISO 15638-3, may have additional requirements which may have patent or intellectual property implications. The reader is referred to the regulation regime of the jurisdiction (4.30) and its regulations for instantiation in this respect.
Bibliography


[8] ISO 31 (all parts), Quantities and units

[9] IEC 60027 (all parts), Letter symbols to be used in electrical technology

[10] ISO 1000, SI units and recommendations for the use of their multiples and of certain other units


[12] ISO 690-2, Information and documentation — Bibliographic references — Part 2: Electronic documents or parts thereof

[13] UNECE: Accord européen relatif au transport international des marchandises Dangereuses par Route


The bibliography may include

— documents that are not publicly available,

— documents which are only cited in an informative manner, and

— documents which have merely served as bibliographic or background material in the preparation of the document.
For online referenced documents, information sufficient to identify and locate the source shall be provided. Preferably, the primary source of the referenced document should be cited, in order to ensure traceability. Furthermore, the reference should, as far as possible, remain valid for the expected life of the document. The reference shall include the method of access to the referenced document and the full network address, with the same punctuation and use of upper case and lower case letters as given in the source (see ISO 690-2[12]).