SLOVENSKI STANDARD
SIST EN ISO 24978:2009

01-december-2009

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Intelligent transport systems - ITS Safety and emergency messages using any available wireless media - Data Registry procedures (ISO 24978:2009)

Intelligente Verkehrssysteme - Automatischer Notruf zu Unfallmeldung (ISO 24978:2009)

Systèmes intelligents de transport - Messages de sûreté et d'urgence pour les SIT utilisant tous les moyens de transmission sans fil disponibles - Procédures d'enregistrement des données (ISO 24978:2009)

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ICS:

03.220.20	Cestni transport	Road transport
35.240.60	Uporabniške rešitve IT v transportu in trgovini	IT applications in transport and trade

SIST EN ISO 24978:2009   **en**

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 24978

October 2009

ICS 35.240.60; 03.220.01

English Version

Intelligent transport systems - ITS Safety and emergency messages using any available wireless media - Data registry procedures (ISO 24978:2009)

Systèmes intelligents de transport - Messages de sûreté et d'urgence pour les SIT utilisant tous les moyens de transmission sans fil disponibles - Procédures d'enregistrement des données (ISO 24978:2009)

Intelligente Verkehrssysteme - Automatischer Notruf zu Unfallmeldung (ISO 24978:2009)

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EN ISO 24978:2009 (E)

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Foreword

This document (EN ISO 24978:2009) has been prepared by Technical Committee ISO/TC 204 "Intelligent transport systems" in collaboration with Technical Committee CEN/TC 278 "Road transport and traffic telematics" the secretariat of which is held by NEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by April 2010, and conflicting national standards shall be withdrawn at the latest by April 2010.

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INTERNATIONAL STANDARD

ISO

24978

First edition
2009-10-01

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

Systèmes intelligents de transport — Messages de sûreté et d'urgence pour les SIT utilisant tous les moyens de transmission sans fil disponibles — Procédures d'enregistrement des données

Reference number
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ISO 24978:2009(E)

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 24978 was prepared by Technical Committee ISO/TC 204, *Intelligent transport systems*.

Introduction

The scale of death and injury on the roads of the world is recognized as a significant problem. To use a relatively safe continent, Europe, as an example, the European project Emerge calculated that in the EU, in 1998 (then including 15 countries), there were 43 000 dead and 1,7 million injured on the roads. By 2004, collated national statistics showed that the toll still exceeded 41 000 dead and 1,5 million injured. The death and injury toll in North America is at a similar level, and although, pro rata, the death and injury rates in Japan are at a slightly lower level, they remain unacceptable. Despite an aggressive road-safety policy, the statistics are slightly worse in Australia. In the emerging countries, the death and injury toll is significantly higher in almost every country.

As a result, in a series of initiatives around the world, governments have committed themselves to halving this carnage within a decade. In most of the developed world, where there have already been strenuous efforts to make the driving experience safer, it is becoming increasingly more difficult to make further improvements using traditional techniques. Intelligent transport systems (ITS) are therefore seen as being the key to achieving the ambitious targets that have been set.

Many ITS systems involve the exchange of data in order to provide services, and particularly safety services. Data is, and increasingly will be, sent from the infrastructure to the vehicle, from vehicle to infrastructure, from vehicle to vehicle, around the vehicle, and around the infrastructure. Much of this data remains within closed systems; however, an increasing amount of data can be shared to improve ITS service provision, and in particular, improve the safety of the driving experience and make a major contribution to the reduction of the death and injury toll. A number of intelligent transport systems/eSafety initiatives, such as "eCall" and "Automatic Crash Notification" crash messaging systems, are being developed. The European eCall project has an ambitious target to automatically provide, across the whole of Europe, a common 'minimum set of data' (MSD) to public service assistance providers (PSAPs) in the event of a crash.

Some of these data concepts, such as the MSD, are or will be defined and declared in International or Regional Standards, but much of the available and potentially useful data is not codified, and can be difficult to codify in standards because of differences between proprietary systems, and the speed at which the rapid evolution of systems provide data, which is much faster than the standardization process can agree and codify it.

Some of this data can be very useful to relevant third parties in crash, crash avoidance, crash mitigation and emergency systems. For example, a vehicle manufacturer can generate information about the number of persons in a vehicle, whether those persons are large or small (to ensure that airbags inflate safely), and they can monitor tyre pressure, speed of travel, etc. The available information can vary from vehicle model to vehicle model, can differ according to the manufacturer's market strategies, and will certainly differ and evolve over time so that the data available in a particular model in 2015 will be enhanced or different to that available in the same model in 2010. In these circumstances, it will be difficult or impossible to 'standardize' the available data as this would slow down the speed at which additional safety measures could be introduced, and interfere with the marketing incentives to provide additional safety services.

However, vehicle manufacturers might be able and willing to share that information with the emergency services, and might need an easy way to share information in collision avoidance and accident mitigation systems (such as ice and slippery-road alerts) and indeed might wish to collate data in order to more quickly identify and rectify design and software faults and reduce their exposure to liabilities. Road authorities might wish to make national data [such as variable message sign (VMS) information] available to vehicles in advance of international standardization of VMS messages or to deal with messages peculiar to that country.

While Europe can succeed in defining and codifying the common data concept known as the MSD, and can succeed in persuading vehicle manufacturers (by encouragement or legislation) to make this data available in the event of a crash or emergency, this will not pertain around the world. Other global initiatives, such as the 'Global Standards Cooperation' task force on automatic crash notification and emergency messages, can define additional or different data concepts. As described in the examples given in this introduction, vehicle manufacturers themselves will define data concepts that can be useful in the event of a crash or emergency, and to otherwise improve the safety of the driving experience.

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As technical capability improves and as more attention is given to safety-related services, it becomes imperative that transmitted messages can be quickly and clearly understood by the recipient, or by both parties in interactive safety systems.

There can be a wide variety of message recipients. In the case of emergency crash messages, this can be a public service answering point (PSAP) which can be highly automated, or it can be a simple human respondent whose requirement is to get some precise, and accurate, human readable data to support a telephone call to the emergency services. At the other end of the scale, in respect of automated collision-avoidance systems, and other automatic safety ITS services, this can be a vehicle-vehicle, infrastructure-vehicle, or vehicle-infrastructure communication. Throughout the whole range of such messages, it is crucial that safety-related messages be quickly, clearly and unambiguously understood by the recipient.

This requires that the definition of the data be not only precise, but also freely available, whether available to system designers at the point of system design/deployment, or immediately available to a PSAP or other relevant recipient in respect of situations such as emergency crash-notification systems. This requires the availability of a common data registry as a repository for these safety-related messages and data concepts.

This International Standard provides the framework for the standardized operation and quality of service for one or more freely available data registries for ITS safety messages and data concepts.

The definitions in this International Standard are consistent with ISO 14817 (ITS Data Registries) and ISO/IEC 11179 (General principles for data registries).

In respect of automatic safety systems, such messages are normally determined at the point of system specification. However, in practice, in-vehicle technology is already developing rapidly, and will continue to do so, and new and additional data can well become available during the life of a system. In case of emergency, vehicles will have available data on board that can be useful, indeed vital, to PSAPs. For liability reasons, now that vehicles are data rich, vehicle manufacturers can well equip vehicles with an "Event Data Recorder" (EVR), the equivalent of the aircraft "Black Box". Such a device can identify factors such as the speed of the vehicle immediately before the crash, acceleration/deceleration rates, whether anti-lock or traction control systems were activated, etc. Future vehicles can also carry data from collision-avoidance warnings and collision-avoidance technology: how many passengers, what gear the car was in, etc. Where these systems (or other useful and related information) are available, they can provide very useful and timely information to a relevant recipient such as a PSAP; it cannot, however, be "required" as part of a "Standard" message.

The resultant "ITS Emergency and Safety Data Registry/Registries" are therefore likely to contain a mix of standardized data concepts, proprietary data concepts, and data concepts designed for national or regional use.

Additionally, there is the important consideration that equipment introduced into vehicles in 2010 can still be operational in 2040, whereas wireless communications media have much shorter life expectations. So in addition to new and additional data concepts, the means of carrying these across wireless media will also change. This International Standard is therefore media independent. It does not specify any particular means of data transfer; it simply enables data that is transferred to be unambiguously understood by the recipient.

To improve the veracity of receipt of crash information, rather than relying on a single media, it is felt that, in many circumstances, such vital information is sent, where possible over multiple media, indeed using each and every available media.

It is also not the intention that there will necessarily be a single global ITS emergency and safety message data registry, although this can be desirable for specific reasons. Regional or national instantiations can also be supported by this International Standard.

This International Standard provides the framework in which to operate such a data registry. It does not mandate the use or provision of any data concepts, nor involve itself with the security of transmission, issues of privacy, nor technical means of data transfer. It simply provides the rules to operate, with a high quality of service, a data repository to enable relevant parties to immediately, usually by automatic means, understand the precise and unambiguous meaning of an emergency safety-related message.

It is recognized that, in most implementations, tools will be required to use the contents of the data registry. However, this International Standard defines only the procedures for such a registry and the definition of such tools is outside the scope of this International Standard.

INTERNATIONAL STANDARD   **ISO 24978:2009(E)**

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

1 Scope

This International Standard deals with intelligent transport systems.

This International Standard provides a standardized set of protocols, parameters, and a method of management of an updateable "Data Registry" to provide application layers for "ITS Safety messages" using any available wireless media.

2 Conformance

In order to claim conformance with this International Standard, wireless communication shall be established in full compliance with local telecommunication regulations, procedures and protocols for that media using the appropriate International or Regional Standards, and shall be able to demonstrate that they provide the mandatory data, and can provide any standardized optional data elements to the extent that such data is available, and there is an available medium to transmit the message.

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 1000:1992, *SI units and recommendations for the use of their multiples and of certain other units*

ISO/IEC 8824-1:2002, *Information technology — Abstract Syntax Notation One (ASN.1): Specification of basic notation — Part 1*

ISO/IEC 8824-2:2002, *Information technology — Abstract Syntax Notation One (ASN.1): Information object specification — Part 2*

ISO 11179 (all parts), *Information technology — Metadata registries (MDR)*

ISO 14817:2002, *Transport information and control systems — Requirements for an ITS/TICS central Data Registry and ITS/TICS Data Dictionaries*

IEEE 1489:1999, *IEEE standard for data dictionaries for intelligent transportation systems*

4 Terms and definitions

For the purposes of this document, the terms and definitions of ISO 14817 and ISO 11179 and the following apply.

4.1
automatic crash notification
automatic system to provide data notification to public-safety answering points, by means of any available wireless communications media, that a vehicle has crashed, and to provide coordinates and other relevant information in a message of standardized data concepts, not limited in length

1

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4.2
eCall
⟨generic⟩ system to provide notification and relevant coordinate information to public-safety answering points, by means of wireless communications, that there has been an incident that requires a response from the emergency services

4.3
eCall
⟨ITS Specific⟩ user instigated or automatic system to provide notification to public-safety answering points, by means of wireless communications, that a vehicle has crashed, and to provide coordinates and a defined minimum set of data

5 Abbreviated terms

5.1
CCC
change control committee

5.2
ETSI
European Telecommunications Standards Institute

5.3
EU
European Union (EU15 implies the 15 countries that formed the European Union prior to 2005)

5.4
GPS
global positioning system

5.5
ID
identity

5.6
ITS
intelligent transport system

5.7
m
mandatory

5.8
o
optional

5.9
OID
object identifier

5.10
PSAP
public service answering point

6   Requirements for "ITS Safety Messages Data Registry" management

6.1   Concept of operation

This clause provides a summary overview of "ITS Safety messages" data dictionary and "Data Registry" operations. It identifies the parties involved in "ITS Safety messages" data dictionary and "Data Registry" operations, and specifies the responsibilities of each of the parties involved.

6.2   Summary

The "ITS Safety Messages Data Registry" shall support the harmonization of data concepts (e.g. data elements) from different stakeholder groups. It shall be consistent with ISO 14817 (Requirements for an ITS central "Data Registry" and ITS "Data Dictionaries"), and it and/or its entries are able to be submitted as (a) candidate(s) for an "ITS Data Registry" that is in accordance with ISO 14817.

The definition of key data elements may arise from numerous sources: PSAPs, automotive manufacturers, regulators, etc. Moreover, different groups will have an interest in the definition of the same data concept, which could lead to the prospect of duplicate or similar definitions being developed.

An ITS Safety or emergency data concept is data in a predefined and registered concept, recorded in such a manner that it is unambiguous and can be interpreted by reference to the data registry. The nature of form of the emergency or safety message is not defined by this International Standard, nor are the circumstances in which such a message is transmitted nor are the destination of the messages defined. This International Standard provides a specification of a process to register such data concepts in accordance with internationally recognized quality and implementation procedures as defined in International Standards, within the context of ITS. The procedures for submission and an acceptance process are defined herein.

A central "ITS Safety Messages Data Registry", or regional and national variants, of which the concept of operations are defined herein, supports standardization and harmonization processes that facilitate the different interested parties to share data element definitions and avoid duplication, yet enable the prompt admission of clearly defined and unambiguous entries from recognized sources, even where consensus and common data-concept definitions between interested parties have not yet been agreed upon.

The operational concept of the data registration is described in the following subclauses. See Annex C for specific procedural details.

NOTE   There may be regional and national variations of this concept for operations.

6.3   Framework

The overall framework for the "ITS Safety Messages Data Registry" and "ITS Safety messages data dictionaries" is presented in Figure 1. It illustrates the relationships between

— the ITS safety services architectures (and information models),

— the "ITS Safety messages data dictionaries" (that are intended to include all data concepts),

— an "ITS Safety Messages Data Registry", and

— the ITS safety services applications.

For each of these physical elements, the diagram in Figure 1 also lists their key functions. For "Data Dictionaries", the "Data Registry" and the applications, it further identifies the key stakeholders or stakeholder groups that participate in or manage their operations. Finally, the diagram illustrates the information exchanged between these operational elements.

"ITS Safety messages data dictionaries" shall contain data concepts based on information flows documented in an "ITS Safety Messages Architecture". Each data concept in a data dictionary shall reference one or more