



EUROPEAN COMMISSION

Recommendation of the Commission of the European Communities
to the Member States and Industry

on

SAFE AND EFFICIENT IN-VEHICLE INFORMATION
AND COMMUNICATION SYSTEMS : A EUROPEAN
STATEMENT OF PRINCIPLES ON
HUMAN MACHINE INTERFACE

Summary

Newest information and telecommunication technologies are at the basis of telematics systems for road transport which are implemented especially in vehicles. They aim at increasing transport efficiency, improving traffic safety, reducing the negative impact of traffic on the environment and increasing the comfort of the drivers and travellers and their use is, in principle, not constrained by national frontiers.

It is essential that these systems do not distract, disturb or overload the driver by the communication process, the information and its handling.

In order to maximise the safety benefits offered by these new devices, a series of principles should be respected which support road safety.

On the other hand the market opportunities for industry and added value service providers should not be inhibited unnecessarily and the development of future safe innovative products in the field of automotive information and telecommunication technologies should be encouraged.

A mixed taskforce of members from industry and public organisations set up by the Commission have taken into account the different aspects of the problem and prepared the Statement of Principles on Human Machine Interface for In-Vehicle Information and Communication Systems to maximise their safety potential.

The purpose of the present Commission Recommendation is to widely disseminate this Statement of Principles through the Member States to the main actors in the field at this early stage of development, so that industry will take them into account in their designs for the benefit of their customers.

Following an initial period of 2 years from the date of publication and depending on the implementation of the Statement of Principles on HMI for in-vehicle information and communication systems by industry, the Commission will consider the necessity for additional actions.

**Commission Recommendation to the Member States and Industry of 22
December 1999**
on
**Safe and Efficient In-Vehicle information and Communication Systems : a
European Statement of Principles on Human Machine Interface**

The Commission of the European Communities,

Having regard to the Treaty establishing the European Community, and in particular Article 211 thereof,

Whereas the importance of a safe Human Machine Interface (HMI) for in-vehicle information and communication systems has been stressed many times in Resolutions, Conclusions and Opinions of several European Institutions such as the Council Conclusions of 17 June 1997, the European Parliament Resolution of 8 October 1998 and the Opinion of the Committee of the Regions of 14 May 1998¹ on the Commission Communication COM(97)223 of 20 May 1997 related to a Community Strategy and Framework for the Deployment of Road Transport Telematics in Europe; the Council Resolution of 17 June 1997² on the development of Telematics in road transport, in particular with respect to electronic fee collection;

Whereas a basis for consumer protection is given by the Council Directive 92/59/EEC of 29 June 1992 on general product safety³ and the Council Resolution of 17 December 1998 on operating instructions for technical consumer goods⁴ but is not specific enough in particular in the present field;

Whereas telematics devices inside vehicles will have an important impact on road transport in the near future and will provide valuable assistance to the driver under the condition that the driver is not distracted, disturbed or overloaded by the communication process and/or the information provided by the additional devices;

Whereas the market opportunities for industry and added value service providers should not be inhibited unnecessarily and the development of future safe innovative products in the field of automotive information and telecommunication technologies should be encouraged;

Whereas principles should be set-up to be followed on a voluntary basis by the relevant market players;

¹ CdR 256/97, 14.5.1998.

² OJ C 194, 25.6.1997 p. 5.

³ OJ L 228, 11.8.1992, p. 24.

⁴ OJ C 411, 31.12.1998, p.1.

Whereas a general safety requirement needs to be established for products in order to lift barriers to trade within the internal market;

Whereas a European Statement of Principles on the Human Machine Interface of in-vehicle information and communication systems is essential to maximise their safety potential; whereas this Statement of Principles should fully take into account earlier work done in the framework of other international organisations such as the European Conference of Ministers of Transport and United Nations;

Whereas further work is being carried out by the Commission on the expansion of the principles, explaining in more detail each principle, describing the rationale and giving good and bad examples whenever necessary as well as on their verification procedures, whenever possible; whereas a report on the expansion of principles will be presented by the end of 1999.

Whereas the Commission services are going to collect information from the Member States on the steps taken and the evaluation results about the adherence to these principles by industry and undertake if necessary additional investigations;

Whereas after an initial period of 2 years and depending on the adherence to the Statement of Principles on HMI for in-vehicle information and communication systems, the Commission will consider the necessity for additional actions as adaptation of the Directive 92/53/EEC⁵ of 18 June 1992 on the approximation of the laws of the Member States relating to the type approval of motor vehicles and their trailers or introduction of a supplementary Directive, using CEN/ISO standards;

Whereas the requirements cited above cannot be achieved on national level,

Makes the following Recommendation:

1. The European motor manufacturing and supply industry which provide and/or fit and/or design in-vehicle information and communication systems, whether original equipment providers or after market system providers, including importers, should comply with the attached Statement of Principles and are invited to enter into a voluntary agreement on this matter.

This statement of principles summarises essential safety aspects to be taken into account for the Human Machine Interface (HMI) for in-vehicle information and communication systems and is concerned with all these systems intended for use by the driver while driving. In this context the principles consider that the driver's primary driving task is safely controlling the vehicle through a complex dynamic traffic environment.

These principles are valid :

- Whether the system is directly related to the driving task or not
- For both portable and permanently installed systems such as telephones

⁵ OJ L 225, 10.8.1992, p.1

- For both Original Equipment Manufacturers and after market system providers including importers for all road vehicle types provided on the Community market.
2. Member States are invited to encourage industry to adhere to this Statement of Principles and to investigate the adherence to these principles by industry, including after market system providers.
 3. Member States should inform the Commission within a period of 12 months from publication of this recommendation of the steps taken by them and by their industry and should provide evaluation results within a period of 24 months about the adherence to these principles by industry.

Done at Brussels, .1999

For the Commission
Erkki LIIKANEN
Member of the Commission

ANNEX

STATEMENT OF PRINCIPLES ON HUMAN MACHINE INTERFACE (HMI) FOR IN-VEHICLE INFORMATION AND COMMUNICATION SYSTEMS

1. Definition of Objectives : this statement of principles summarises essential safety aspects to be taken into account for the Human Machine Interface (HMI) for in-vehicle information and communication systems.

This statement of principles will be of particular use to manufacturers when they have to consider the safety implications of HMI design. Design and installation issues are the main concern of this statement of principles and they therefore relate to the following critical issues:

- How to design and locate information and communication systems in such a way that their use is compatible with the driving task.
- How to present information so as not to impair the driver's visual allocation to the road scene.
- How to design system interaction such that the driver maintains under all circumstances safe control of the vehicle, feels comfortable and confident with the system and is ready to respond safely to unexpected occurrences.

In order not to create unnecessary obstacles or constraints to the innovative development of products, the statement of principles is expressed mainly in terms of the goals to be reached by the HMI.

2. Scope : this statement of principles is concerned with all information and communication systems intended for use by the driver while driving. In this context the principles consider that the driver's primary driving task is safely controlling the vehicle through a complex dynamic traffic environment.

For the purpose of this statement of principles "the system" refers to the functions and parts, such as displays and controls, that constitute the interface and interaction between the system and the driver.

These principles have been formulated to consider the design and installation of individual systems. Where more than one system is present within a vehicle they should ideally be presented as an integrated driver interface where the complete installation also complies with these statement of principles.

The main topics of this statement of principles are overall design, installation, information presentation, interaction with displays and controls, system behaviour and information about the system.

The statement of principles does not cover aspects of information and communication systems not related to HMI such as electrical characteristics, material properties, system performance and legal aspects.

3. Existing provisions : this statement of principles is not a substitute for regulations and standards and these should always be respected and used by manufacturers.

- Applicable EC Directives with their subsequent amendments include :
 - on the field of vision of motor vehicle drivers : Commission Directive 90/630/EEC of 30 October 1990¹;
 - the interior fittings of motor vehicles (interior parts of the passenger compartment other than the interior rear-view mirrors, layout of controls, the roof or sliding roof, the backrest and rear part of seats) : Council Directive 74/60/EEC of 17 December 1973²;
 - the interior fittings of motor vehicles (identification of controls, tell tales and indicators) : Council Directive 78/316/EEC of 21 December 1977³.
- Council Resolution of 17.12.1998⁴ on operating instructions for technical consumer goods.
- Council Directive 92/59/EEC of 29.6.1992 on general product safety⁵.
- Economic Committee for Europe (UN/ECE) regulations which are recognised by the Community after its recent adhesion to the Revised Agreement of 1958.
- Standards and standard documents in preparation implicitly referred to in the principles are:

ISO 4513 Road Vehicles - Visibility. Method for Establishment of Eyellipse for Drivers' Eye Location.

ISO 2575 Road Vehicles - Symbols for Controls, Indicators and Tell-tales.

ISO 4040 Road Vehicles - Location of Hand Controls, Indicators and Tell-tales.

ISO 3958 Road Vehicles - Passenger Car Driver Hand Control Reach.

ISO (DIS) 15005 Road Vehicles - Traffic Information and Control Systems (TICS) Dialogue Management Principles.

ISO (DIS) 15006 Road Vehicles - Traffic Information and Control Systems (TICS) Auditory Presentation of Information.

ISO (DIS) 15008 Road Vehicles - Traffic Information and Control Systems (TICS) Ergonomic aspects of In-Vehicle Information Presentation.

¹ OJ L 341, 6.12.1990, p. 20.

² OJ L 38, 11.2.1974, p. 2.

³ OJ L 81, 28.3.1978, p. 3.

⁴ OJ C 411, 31.12.1998, p. 1.

⁵ OJ L 228, 11.8.1992, p. 24.

ISO (DIS) 11429 Ergonomics - System Danger and non Danger Signals with Sounds and Lights.

All standards are subject to revision, and users of this statement of principles should apply the most recent editions of the standards indicated here.

Generally, it will be clear where the responsibility lies, among manufacturers, suppliers and installers, to apply the principles. Where the responsibility rests with more than one party, those parties are encouraged to use the principles as a starting point to explicitly confirm their respective roles.

The responsibilities of the driver related to safe behaviour while driving and interacting with these systems remain unchanged.

4. Overall Design Principles : the system should be designed to support the driver and should not give rise to potentially hazardous behaviour by the driver or other road users.

The system should be designed in such a way so that the allocation of driver attention to the system displays or controls remain compatible with the attentional demand of the driving situation.

The system should be designed so as not to distract or visually entertain the driver.

5. Installation principles : the system should be located and fitted in accordance with relevant regulations, standards and manufacturers instructions for installing the system in vehicles.

No part of the system should obstruct the driver's view of the road scene.

The system should not obstruct vehicle controls and displays required for the primary driving task.

Visual displays should be positioned as close as practicable to the driver's normal line of sight.

Visual displays should be designed and installed to avoid glare and reflections.

6. Information Presentation Principles : visually displayed information should be such that the driver can assimilate it with a few glances which are brief enough not to adversely affect driving.

Where available, internationally agreed standards relating to legibility, audibility, icons, symbols, words, acronyms or abbreviations should be used.

Information relevant to the driving task should be timely and accurate.

The system should not present information, which may result in potentially hazardous behaviour by the driver or other road users.

The system should not produce uncontrollable sound levels liable to mask warnings from within the vehicle or outside.

7. Principles on Interaction with displays and Controls : the driver should always be able to keep at least one hand on the steering wheel while interacting with the system.

Speech based communications systems should include provision for hands-free speaking and listening.

The system should not require long and uninterruptable sequences of interactions.

System controls should be designed such that they can be operated without adverse impact on the primary driving task.

The driver should be able to control the pace of interaction with the system.

The system should not require the driver to make time-critical responses when providing inputs to the system.

The driver should be able to resume an interrupted sequence of interactions with the system at the point of interruption or at another logical point.

The driver should have control of auditory information where there is a likelihood of distraction or irritation.

The system's response (e.g. feedback, confirmation) following driver input should be timely and clearly perceptible.

Systems providing non-safety related dynamic visual information should be capable of being switched into a mode where that information is not provided to the driver.

8. System Behaviour Principles : visual information not related to driving that is likely to distract the driver significantly (e.g. TV, video and automatically scrolling images and text) should be disabled or should only be presented in such a way that the driver cannot see it while the vehicle is in motion.

The presence, operation or use of a system should not adversely interfere with displays or controls required for the primary driving task and for road safety.

System functions not intended to be used by the driver while driving should be made impossible to interact with while the vehicle is in motion, or clear warnings should be provided against the unintended use.

Information about current status, and any malfunction, within the system that is likely to have an impact on safety should be presented to the driver.

In the event of a partial or total failure of the system, the vehicle should remain controllable, or at least should be capable of being brought to a halt in a safe manner.

9. Principles on Information about the system : the system should have adequate instructions for the driver covering use and relevant aspects of installation and maintenance.

System instructions should be correct and simple.

System instructions should be in languages or forms designed to be understood by the driver.

The instructions should clearly distinguish between those aspects of the system which are intended for uses by the driver while driving and those aspects (e.g. specific functions, menus etc) which are not intended to be used while driving.

All product information should be designed to convey accurately the system functionality.

Product information should make it clear if special skills are required to use the system or if the product is unsuitable for particular users.

Representations of system use (e.g. descriptions, photographs and sketches) should neither create unrealistic expectations on the part of potential users nor encourage unsafe or illegal use.