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►B ►C1 **COMMISSION DECISION**

of 29 April 2004

modifying Annex A to Decision 2002/731/EC of 30 May 2002 and establishing the main characteristics of Class A system (ERTMS) of the control-command and signalling subsystem of the trans-European conventional rail system referred to in Directive 2001/16/EC of the European Parliament and of the Council

(notified under document number C(2004) 1559)

(Text with EEA relevance)

(2004/447/EC) ◄

(OJ L 155, 30.4.2004, p. 69)

Amended by:

		Official Journal		
		No	page	date
►M1	Commission Decision 2006/679/EC of 28 March 2006	L 284	1	16.10.2006

Corrected by:

►C1 Corrigendum, OJ L 193, 1.6.2004, p. 53 (2004/447/EC)

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COMMISSION DECISION

of 29 April 2004

modifying Annex A to Decision 2002/731/EC of 30 May 2002 and establishing the main characteristics of Class A system (ERTMS) of the control-command and signalling subsystem of the trans-European conventional rail system referred to in Directive 2001/16/EC of the European Parliament and of the Council

(notified under document number C(2004) 1559)

(Text with EEA relevance)

(2004/447/EC)

THE COMMISSION OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Community,

Having regard to Council Directive 96/48/EC of 23 July 1996 on the interoperability of the trans-European high-speed rail system [1], and in particular Article 6(2) thereof,

Having regard to Directive 2001/16/EC of 19 March 2001 on the interoperability of the trans-European conventional rail system [2], and in particular Article 6(1) thereof,

Whereas:

(1) This Decision refers to infrastructure and rolling stock equipment which are subject to Directives 96/48/EC and Directives 2001/16/EC and are to be placed in service after the date on which this Decision takes effect.

(2) The first objective of this Decision is to guide the technical choices made by authorities responsible for planning, constructing, renewing, upgrading and operating the abovementioned infrastructure and rolling stock.

(3) The second objective of this Decision is to update the Annex A of the Commission Decision 2002/731/EC of 30 May 2002 concerning the technical specification for interoperability relating to the control-command and signalling subsystem of the trans-European high-speed rail system referred to in Article 6(1) of Council Directive 96/49/EC [3].

(4) The third objective of this Decision is to establish a definitive reference of the set of specifications that are to be considered in the context of the control-command and signalling subsystem of the trans-European conventional rail system referred to in Article 6(1) of Directive 2001/16/EC. It does not preclude the need to validate and, if necessary, further amend, update or modify these parameters in the corresponding TSI (TSI CCS-CR), which shall be adopted in accordance with Directive 2001/16/EC. These parameters may also be updated as part of the review of the TSIs provided for in this Directive and considering the opinion expressed in the change control management procedure as provided for in the TSI CCS-HS.

(5) In accordance with Article 2(c) of Directive 96/48/EC, the trans-European high-speed rail system is subdivided into structural or

[1] OJ L 235, 17.9.1996, p. 6.
[2] OJ L 110, 20.4.2001, p. 1.
[3] OJ L 245, 12.9.2002, p. 37.

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functional subsystems. Each of the subsystems is to be covered by a technical specification for interoperability (TSI).

(6) Decision 2002/731/EC has set up the TSI relating to the control-command and signalling subsystem of the trans-European high speed rail system (TSI CCS-HS).

(7) The Committee set up under Article 21 of Directive 96/48/EC (hereafter the Committee) has appointed the European Association for Railway Interoperability (hereafter the AEIF) as the joint representative body.

(8) The joint representative body shall be responsible for preparing the review and updating of TSIs and making recommendations to the Committee referred to in Article 21 in order to take account of developments in technology or social requirements.

(9) The AEIF has been given a mandate to review the TSI CCS-HS.

(10) As a result of technological evolution as well as of the feedback of the first set of field applications, a major update of the set of specifications included in Annex A of the above mentioned TSI CCS-HS is deemed required. The AEIF has drawn up the draft of the revised Annex A to the TSI CCS-HS.

(11) The draft revised Annex A has been examined by the representatives of the Member States, in the framework of the Committee.

(12) In accordance with Article 2(c) of Directive 2001/16/EC, the trans-European conventional rail system is subdivided into structural or functional subsystems. Each of the subsystems is to be covered by a technical specification for interoperability (TSI).

(13) As a first step, draft TSIs have to be drawn up by the joint representative body under a mandate from the Commission in accordance with the procedure set out in Article 21(2) to the Directive.

(14) The Committee set up under Article 21 of Directive 2001/16/EC (hereafter the Committee) has appointed the European Association for Railway Interoperability (hereafter the AEIF) as the joint representative body.

(15) The AEIF has been given a mandate to draw up a draft TSI for the control-command and signalling subsystem of the trans-European conventional rail system (TSI CCS-CR).

(16) However, in accordance with Article 6(4) of Directive 2001/16/EC, the first stage in developing the abovementioned TSI is to establish the characteristics of its basic parameters.

(17) In accordance with the abovementioned mandate the AEIF has already drafted a complete TSI for the command-control and signalling subsystem of the trans-European conventional rail system (TSI CCS-CR). This TSI will be adopted once the cost-benefit analysis foreseen by Directive 2001/16/EC are developed and after consultation of users organisations and social partners.

(18) The multiplication of ERTMS-related projects for conventional applications both within the European Union and in the accessing countries does press for a reference for conventional rail to emerge. Most of these projects evolve nowadays based on a loose compliance with the current TSI CCS-HS, a situation that could potentially lead to yet another non-interoperable legacy at European level then rooted on different national flavours of ERTMS.

(19) The extension of the high-speed parameters to conventional rail is clearly justified by both market and operational reasons. They range from the scale-effects associated to a uniqueness of solutions between high-speed and conventional rail, to the

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fulfilment of the operational needs of high-speed trains when they are bound to use the conventional network.

(20) A unique solution for both high-speed and conventional rail is a pivotal concept underpinning ERTMS that has commanded a strong support within the railway sector at large — both by the supply industry and by the railway companies alike.

(21) The revised reference basic parameters for the TSI CCS-HS should therefore be also adopted as the reference basic parameters for the Class A system of the TSI CCS-CR.

(22) The measures provided for in this Decision are in accordance with the opinion of the Committee set up by Directive 96/48/EC,

HAS ADOPTED THIS DECISION:

Article 1

The Annex A to the TSI attached to Decision 2002/731/EC setting up the TSI relating to the control-command and signalling subsystem of the trans-European high-speed rail system is replaced by the table mentioned in the Annex to this Decision.

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Article 3

This Decision is addressed to the Member States.

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ANNEX

ERTMS CHARACTERISTICS

1. **DESCRIPTION OF THE PARAMETER**

The unified control/command and signalling subsystem (ERTMS — European rail traffic management system) comprise two elements:

— the control/command and signalling element (ERTMS/ETCS — European rail traffic management system/European train control system) covers both the onboard subsystems and track-side subsystems,

— the radio and telecommunication element (ERTMS/GSM-R — GSM for railways) is based on the standards applied to the public GSM network and also covers both track-side and onboard equipment. GSM-R is based on ETSI standard GSM phase 2+, including GPRS (global packet radio services), extended to railway-specific applications.

2. **CHARACTERISTICS TO BE RESPECTED**

2.1. ERTMS/ETCS:

The basis for the control-command and signalling subsystem shall be the set of specifications listed in the following table. If deemed necessary, these specifications can be revised and extended in accordance with the TSI revision procedure of Directives 96/48/EC and 2001/16/EC. Such a revision will consider the opinion expressed in the ERTMS Change Control Management procedure, taking into account the fact that a consolidation phase is necessary for the ERTMS specifications, based on the trial sites and the first implementations

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ANNEX A

SPECIFICATIONS FOR INTEROPERABILITY

All specifications referred to in this table are mandatory unless they are clearly marked as 'informative'.

GLOBAL REQUIREMENTS

Inde-xNo	Control-commandTSI paragraph reference ([1])	Subject ([2])	Scope ([3])	European specifications defining basic parameters	Other European specifications
0a.	4.1.1	ETCS FRS		UIC ETCS FRS Version 4.29 EEIG 99E5362 Version 2.00	
0b.	4.1.1	GSM-R FRS		EIRENE FRS Version 6.0	
1	3.2.1	Safety assurance.	Informative documentation: EN 50128 March 2001		EN50126 September 1999 EN50129 February 2003
2		RAMS			
2a.	3.2.1 4.1.1	Safety requirements	Informative documentation UNISIG SUBSET -077-V222 UNISIG SUBSET -078-V222 UNISIG SUBSET -079-V222 (2parts) UNISIG SUBSET -080-V222 (2 parts) UNISIG SUBSET -081-V222 (2 parts) UNISIG SUBSET -088-V222 (6 parts)	UNISIG SUBSET -091-V222	EN50129February 2003
2b.	3.2.2e	Reliability-availability-requirements.	ERTMS/96s1266- (RAM chapter) to be used as input information. Informative documentation: EEIG 02S1266- Version 6	Reserved	EN 50126 September 1999
2c.	3.2b	Quality of maintenance.	The procedures against which the quality of the maintenance of control-command equipment is to be judged.	Reserved	EN 29000 andEN 29001

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Inde-xNo	Control-commandTSI paragraph reference (1)	Subject (2)	Scope (3)	European specifications defining basic parameters	Other European specifications
3	3.2.5.1.1 4.2.1.2d	Environmental physical conditions.	The minimum requirements upon temperature, humidity, shock, vibration etc. that Control-Command equipment shall respect for use upon the high-speed network. Informative documentation: EEIG 97S0665- Version 5, EN50125-3 October 2003	Reserved	EN 50125-1 September 1999 and EN 50155 August 2001
4	3.2.5.1.2	Electromagnetic compatibility:			
4a.	3.2.5.1.2 4.2.1.2d	Electromagnetic compatibility	ERTMS/97s0665- to be used as input document. For the purpose of EMC, frequency bands for intentional transmission (Eurobalise, Euroloop, and GSM-R) are excluded from the specifications indicated in this index. Specific requirements for the Eurobalise air-gap are indicated in index 12a. Specific requirements for the Euroloop air-gap are indicated in index 12b. Specific requirements for GSM-R air-gap are indicated in index 12c.	Reserved	For on-board equipment: EN 50121-3-2, September 2000, Tables 4 and 6 in Clause 7. Clauses 4, 5, and 6 are applicable for testing procedures. EN 50121-3-2, September 2000, Tables 7, 8, and 9 in Clause 8. Clauses 4, 5, and 6 are applicable for testing procedures. For track-side equipment: EN 50121-4, September 2000, Clause 5. EN 50121-4, September 2000, Clause 6
4b	3.2.5.1.2b 4.2.1.2f	The immunity characteristics of train detection systems.	To ensure that train detection systems are not perturbed by traction current. Input for European specification is contained in the report to TSI CC.	Reserved	(reserved)

(1) The references of this column are only valid in the case of the TSI CCS-HS.
(2) This is the subject addressed in the paragraph referenced in the TSI.
(3) This is a description of the intent of the standard required to support the TSI.

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CONTROL COMMAND FUNCTIONS

Inde-xNo	Control-commandTSI paragraph reference	Subject (1)	Scope (2)	European specifications defining basic parameters	Other European specifications
5		Provision of cab-signalling logic and ATP logic and associated functions.			
5a.	4.1.1	Normal operation.	Informative documentation: UNISIG SUBSET-050-V200, UNISIG SUBSET-076-0-V222 UNISIG SUBSET -076-2-V221 UNISIG SUBSET -076-3-V221 UNISIG SUBSET -076-4-1-V100 UNISIG SUBSET -076-4-2-V100 UNISIG SUBSET -076-5-3-V220 UNISIG SUBSET -076-5-4-V221 UNISIG SUBSET -076-6-1-V100 UNISIG SUBSET -076-6-4-V100 UNISIG SUBSET -076-6-5-V100	UNISIG SUBSET-026- V222 UNISIG SUBSET-043-V200 UNISIG SUBSET-046-V200 UNISIG SUBSET-047-V200 UNISIG SUBSET-054-V200 UNISIG SUBSET-055- V222 UNISIG SUBSET -076-5-1-V221 UNISIG SUBSET -076-5-2-V221 UNISIG SUBSET -076-6-3-V100 UNISIG SUBSET -076-7-V100 UNISIG SUBSET -094-0-V100	
5b.	4.1.1	Degraded operation	The system requirements in response to failures. ERTMS/97E832 to be used as input for European specification	UNISIG SUBSET-026- V222	
6	4.1.1 4.1.2.2	STM management.	The functional and physical requirements on the STM interface to the Class A system. KER compatibility is to be addressed. Informative documentation: UNISIG SUBSET-059-V200	UNISIG SUBSET-035-V211 UNISIG SUBSET-026- V222 UNISIG SUBSET-056-V220 UNISIG SUBSET-057-V220 UNISIG SUBSET-058-V211	
7	4.1.1	MMI driver interface functional requirements.	The functional specification for communication between the driver and the onboard assembly. The driver's displays states what is required for driving e.g. cab-signals, warning of intervention. It includes the input functions e.g. train characteristics, override functions, required for interoperable control-command purposes. It also includes the display of text messages.	UNISIG SUBSET-033-V200 UNISIG SUBSET-026- V222 UNISIG SUBSET-035-V211	

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Inde-xNo	Control-commandTSI paragraph reference	Subject ([1])	Scope ([2])	European specifications defining basic parameters	Other European specifications
			The cab-signals define the minimum range of parameters made available in the cab that together satisfy all the circumstances that could be found upon the railways of the European high-speed network and that therefore make a system common for the whole network feasible. Such parameters would be permitted speed, target speed, target distance, that are the basis of cab-signalling and ATP. Informative documentation: CENELEC WGA9D V21.DOC 12/04/2000, CENELEC WGA9D V05 DOC 27/03/2000, CENELEC WGA9D V11.DOC 12/04/2000, CENELECWGA9D V06.DOC 12/01/2000, CENELEC WGA9D V08NS.DOC 27/03/2000and CENELEC WGA9D V04.DOC 27/03/2000.		
8	4.1.1	Odometry requirements	The functional requirements of the odometry sub-system required to support the range of performance expected of the equipment providing the Class A interfaces. Location accuracy depends on odometry and the distance between balises. The requirements for speed and distance measurements on an interoperable train. Note relation with index 6, STM	UNISIG SUBSET-041-V200	
9	4.1.1	Requirements for the onboard recording of operational data	The requirements for the choice of data parameters, regularity, accuracy, validation checks for the purposes of inspecting the proper driving of the train and the behaviour of safety related systems such that the requirements of the legal authorities in all member states can be met.	UNISIG SUBSET-026- V222 UNISIG SUBSET-027-V200	
10	r4.1.1	Vigilance (dead man's) system requirements.	The definition of a vigilance function so that the train can operate acceptably on the European networks.	Reserved	

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Inde-xNo	Control-commandTSI paragraph reference	Subject (1)	Scope (2)	European specifications defining basic parameters	Other European specifications
			Vigilance ensures that the driver is sufficiently alert (and by implication sufficiently alert to be aware of the signalling). If a timer is used, the timer can be reset by other driver actions on the train controls, traction controller, brakes, cab warning acknowledgement. It can be associated with a need to hold a lever in a given position (dead man function). The functionality required of the vigilance can be modified by the status of ATP and any cab warning system. Vigilance, ATP and cab warning systems are safety related systems in the sense that they support the driver and provide protection to the train in the event of human inadequacy. The level of safety is determined by all these systems, and they are inter-dependent in the sense that the presence or absence of one can affect the functionality of the others. The management of the safety issues is facilitated by considering these systems to be in the scope of control-command. UIC 641 is to be the basis for European Specification.		
11	4.1.1 4.2.1.2e	Radio.	The definition of the radio system for voice and data communication to and from the trains.	EIRENE SRS Version 14 Test requirements (to be added in the next version of this TSI)	

(1) This is the subject addressed in the paragraph referenced in the TSI.
(2) This is a description of the intent of the standard required to support the TSI.

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INTERFACES BETWEEN ONBOARD AND TRACKSIDE ASSEMBLIES

Inde-xNo	Control-commandTSI paragraph reference	Subject (1)	Scope (2)	European specifications defining basic parameters	Other European specifications
12		Data transmission interfaces - between the train and the ground.			
12a.	3.2.5.1.2 4.1.2.1	Balise	Technical compatibility with some Class B systems requires the toggling function as defined in the European specifications. This is to be considered acceptable from the point of view of EMC.	UNISIG SUBSET-036-V221 UNISIG SUBSET-085-V212	ETSI EN 300330-1, V1.3.1 (June 2001), up to and including Sub-clause 7.2 (3).
12b.	3.2.5.1.2 4.1.2.1	Loop	Informative documentation: UNISIG SUBSET-050-V200	UNISIG SUBSET-043-V200 UNISIG SUBSET-044-V200 UNISIG SUBSET-045-V200 Test requirements (to be added in the next version of this TSI)	
12c.	3.2.5.1.2 4.1.2.1	Radio		EIRENE SRS Version14	

(1) This is the subject addressed in the paragraph referenced in the TSI.
(2) This is a description of the intent of the standard required to support the TSI.
(3) The applicable Up-link and Tele-powering frequency ranges are defined in UNISIG SUBSET-036-V221.

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INTERFACES ONBOARD BETWEEN CONTROL-COMMAND INTEROPERABILITY CONSTITUENTS

Inde-xNo	Control-commandTSI paragraph reference	Subject (1)	Scope (2)	European specifications defining basic parameters	Other European specifications
13		Onboard data communication interfaces.	The data interfaces between control-command equipment supporting the cab-signalling and automatic train protection functions, and between these functions and the train.		
13a.	4.1.2.2	ERTMS/ETCS Euroradio		UNISIG SUBSET-026- V222 UNISIG SUBSET-034-V200 UNISIG SUBSET-047-V200 UNISIG SUBSET-037-V225 UNISIG SUBSET-093-V226 UNISIG-SUBSET-048-V200 UNISIG SUBSET-092-1-V225 UNISIG SUBSET-092-2-V225	
13b	4.1.2.2	GSM-R	Informative documentation: O-2475 V1.0	A11T6001.12	
13c.	4.1.2.2	Train data interface for analysis of operational data recorded onboard	The communications interface, common to the high-speed network, to the data analyser of the data stored in the control-command systems to ensure readability across all parties interested.	UNISIG SUBSET-027-V200	
13d.	4.1.2.2	Odometry interfaces.	ERTMS/97e267 is to be the basis for a European specification A Specification will not be available in the first step.	Reserved	

(1) This is the subject addressed in the paragraph referenced in the TSI.
(2) This is a description of the intent of the standard required to support the TSI.

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INTERFACES AT THE TRACKSIDE BETWEEN CONTROL-COMMAND INTEROPERABILITY CONSTITUENTS

Inde-xNo	Control-commandTSI paragraph reference	Subject (1)	Scope (2)	European specifications defining basic parameters	Other European specifications
14		Trackside data communication Interfaces between:			
14a.	4.1.2.3	ERTMS/ETCS Euroradio.		UNISIG SUBSET-049-V200 UNISIG SUBSET-026- V222 UNISIG SUBSET-037-V225 UNISIG SUBSET-092-1-V225 UNISIG SUBSET-092-2-V225 UNISIG SUBSET-093-V226	
14b.	4.1.2.3	GSM-R	Informative documentation: O-2475 V1.0	A11T6001.12	
14c.	4.1.2.3	Eurobalise and LEU.		UNISIG SUBSET-036-V221 UNISIG SUBSET-085-V212	
14d.	4.1.2.3	Euroloop and LEU.		UNISIG SUBSET-045-V200	
14e.	4.1.2.3	ERTMS/ETCS and ERTMS/ ETCS (RBC-RBC-handover).		UNISIG SUBSET-039-V200	
15	4.2.4	Key management		UNISIG SUBSET-038-V200	

(1) This is the subject addressed in the paragraph referenced in the TSI.
(2) This is a description of the intent of the standard required to support the TSI.

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COMPATIBILITY (NOT EMC) BETWEEN TRAINS AND TRACK-CIRCUITS

Inde-xNo	Control-commandTSI paragraph reference	Subject (1)	Scope (2)	European specifications defining basic parameters	Other European specifications
16	4.2.1.2B.	Rolling stock characteristics necessary to be compatible with train-detection systems.	The specification that the rolling stock must respect in order that it will operate the train detection systems correctly. To be completed, e.g., to take into account inductivity in case of axleless wheelsets and minimum axleload.	Reserved	

(1) This is the subject addressed in the paragraph referenced in the TSI.
(2) This is a description of the intent of the standard required to support the TSI.

DATA INTERFACES BETWEEN CONTROL-COMMAND AND ROLLING-STOCK

Inde-xNo	Control-commandTSI paragraph reference	Subject (1)	Scope (2)	European specifications defining basic parameters	Other European specifications
17	4.2.1.2E	Train interfaces.	To cover all data concerned by interoper-ability that may pass between the train and control-command equipment.	UNISIG SUBSET-034-V200	

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CONTROL-COMMAND PERFORMANCE

Inde-xNo	Control-commandTSI paragraph reference	Subject (1)	Scope (2)	European specifications defining basic parameters	Other European specifications
18	4.1.1 4.3	Performance Required.	Annexes I and IV of Directive 96/48/EC set out performance definitions of the high-speed network.	UNISIG SUBSET-041-V200	

(1) This is the subject addressed in the paragraph referenced in the TSI.
(2) This is a description of the intent of the standard required to support the TSI.

VERIFICATION REQUIREMENTS

Index-No	Control-commandTSI paragraph reference	Subject (1)	Scope (2)	European specifications defining basic parameters	Other European specifications
32 (3)	6.2	Onboard assembly integration requirements	This shall be sufficient to ensure that the onboard assembly will operate correctly with the trackside assemblies (subsystem-verification considering the options as indicated in the register of rolling stock). Practical running tests have to be performed after the installation of onboard control-command equipment. Special attention shall be given to electro-magnetic compatibility between CC and rolling stock.	UNISIG SUBSET (reserved)	
33	6.2	Trackside assembly integration requirements	This shall be sufficient to ensure that the trackside assembly will operate correctly with the onboard assemblies (subsystem-verification considering the options as indicated in the register of infrastructure).	UNISIG SUBSET (reserved)	

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Index-No	Control-commandTSI paragraph reference	Subject (1)	Scope (2)	European specifications defining basic parameters	Other European specifications
34	Table 6.1 Table 6.2	Installation requirements	The engineering rules that apply when installing the control-command assembly onboard and trackside respectively.	UNISIG SUBSET-040-V200	
35		Glossary of terms and abbreviations		UNISIG SUBSET-023-V200	

(1) This is the subject addressed in the paragraph referenced in the TSI.
(2) This is a description of the intent of the standard required to support the TSI.
(3) Index number 19 through 31 are intentionally deleted.