

# THE TRANS-EUROPEAN HIGH-SPEED RAIL SYSTEM



Guide for the application of the high-speed  
TSIs of Council Directive 96/48/EC



EUROPEAN  
COMMISSION



2003 EDITION

# **THE TRANS-EUROPEAN HIGH-SPEED RAIL SYSTEM**

GUIDE FOR THE APPLICATION OF THE HIGH-SPEED TSIs  
OF COUNCIL DIRECTIVE 96/48/EC

EUROPEAN COMMISSION  
DIRECTORATE-GENERAL FOR ENERGY AND TRANSPORT

Cover photos (from left to right and top to bottom): Roberto Ferravante, SNCF-CAV-Fabbro & Leveque, Renfe/MAN, DB AG/Klee

*Europe Direct is a service to help you find answers  
to your questions about the European Union*

**Freephone number:**

**00 800 6 7 8 9 10 11**

A great deal of additional information on the European Union is available on the Internet.  
It can be accessed through the Europa server (<http://europa.eu.int>).

Cataloguing data can be found at the end of this publication.

Luxembourg: Office for Official Publications of the European Communities, 2004

ISBN 92-894-6301-5

© European Communities, 2004

Reproduction is authorised provided the source is acknowledged.

*Printed in Italy*

PRINTED ON WHITE CHLORINE-FREE PAPER

# Preface by Loyola de Palacio

Vice-President of the European Commission  
Commissioner in charge of transport and energy



The railway sector is constrained by barriers within the industry, which prevent it from competing effectively with other modes of transport, particularly road transport. The establishment of an internal market for railway services and equipment depends, on the one hand, on the opening of access rights to the infrastructure and, on the other hand, on the progressive alignment of technical systems, in order to ensure their interoperability.

Our challenge is to move towards a single European railway area and to establish a fully-fledged internal market for railway services and equipment. Interoperability will play a key role in this and the wider success of railways as a competitive, cost-effective, reliable and safe transport alternative.

Harmonisation of technical and operational specifications for the trans-European rail system is vital for free movement of trains and related equipment in the European internal market.

The interoperability directives, together with European legislation opening up the rail market to regulated competition, are key factors in increasing the rail sector's productivity and in making this sector more competitive relative to other transport modes.

The directives are important in creating a single European railway system, competitive enough to remain one of the leading players in the transport system in the enlarged Europe. The lack of interoperability is one of the problems holding back its development, which Directive 96/48/EC and the related technical specifications for interoperability aim to resolve for the high-speed sector.

Technical and operational barriers work in favour of incumbent companies and hamper the entry of new players. In this respect, harmonising the technical requirements of railway networks <sup>(1)</sup> is paramount.

The railway system cannot be fully competitive without the prior removal of technical and operational barriers to trade in trains and to their interoperability — that is, their ability to run on any interoperable stretch of the high-speed network. Significant differences remain between the networks in Europe, most of which were built from a national perspective and which have long played on these differences to protect their own interests or those of their national railway industry.

This hampered the development of rail transport relative to competing transport modes. These differences have, until now, favoured several compartmentalised markets instead of a single network. Directive 96/48/EC and its related TSIs, with the similar objectives of the construction of the network, the free circulation of trains and the transformation of the supply industry from a multi-domestic to a global one, will contribute to resolving these problems for the high-speed rail system.

A handwritten signature in black ink, appearing to be 'L. de P.' with a horizontal line underneath.

---

<sup>(1)</sup> Interoperability of the conventional rail system is covered by Directive 2001/16/EC.



# Notes

1. This guide is intended to be a reference manual for all parties directly or indirectly concerned by the high-speed technical specifications for interoperability (TSIs) <sup>(2)</sup> related to Directive 96/48/EC <sup>(3)</sup>. It should be read and used as a help for the application of the TSIs; it does not substitute for them. It simply explains and clarifies some of the most important aspects related to the application of the high-speed TSIs. It was developed with and received the agreement of Member States' government experts and other parties concerned. This guide is intended to help minimise the number of applications of the safeguard clauses foreseen in Article 12 and Article 19 of Directive 96/48/EC, particularly those originating from divergent interpretations of the directive and the related TSIs.
2. This guide has been prepared by a working group lead by the Directorate-General for Energy and Transport and comprising representatives of the Regulatory Committee of Directive 96/48/EC, the European Association for Railway Interoperability (AEIF <sup>(4)</sup>) and the European standardisation bodies. The Coordination Group of the Notified Bodies — Rail (NB-Rail) also had the opportunity to contribute and comment on the guide's content. The guide was presented to the Regulatory Committee, which gave a positive opinion concerning its content and scope.
3. The guide is publicly available. It is not binding in the sense of legal acts adopted by the Community.
4. It is important to note that references and procedures contained in this guide concerning the assessment of the conformity or the suitability for use of interoperability constituents as well as the 'EC' verification of subsystems relate only to the high-speed TSIs. The placing of an interoperability constituent on the market or the placing into service of a subsystem in a Member State also requires the fulfilment of all the relevant Community legislation, national legislation and regulatory provisions which are compatible with Community legislation and are applied in a non-discriminatory manner.
5. The guide will be reviewed and, if necessary, updated to reflect progress with European standards and changes to the TSIs. It is not possible to give an agenda for this revision process at the time of writing. The reader should refer to the website of the European Commission for information about the latest available edition of the guide (see Annex 3).

---

<sup>(2)</sup> Commission Decision 2002/730/EC of 30 May 2002 on the technical specification for interoperability of the 'maintenance' subsystem of the trans-European high-speed rail system (OJ L 245, 12.9.2002, p. 1) and Corrigendum (OJ L 275, 11.10.2002, p. 1). Commission Decision 2002/731/EC of 30 May 2002 on the technical specification for interoperability of the 'control command and signalling' subsystem of the trans-European high-speed rail system (OJ L 245, 12.9.2002, p. 37) and Corrigendum (OJ L 275, 11.10.2002, p. 3).

Commission Decision 2002/732/EC of 30 May 2002 on the technical specification for interoperability of the 'infrastructure' subsystem of the trans-European high-speed rail system (OJ L 245, 12.9.2002, p. 143) and Corrigendum (OJ L 275, 11.10.2002, p. 5).

Commission Decision 2002/733/EC of 30 May 2002 on the technical specification for interoperability of the 'energy' subsystem of the trans-European high-speed rail system (OJ L 245, 12.9.2002, p. 280) and Corrigendum (OJ L 275, 11.10.2002, p. 8).

Commission Decision 2002/734/EC of 30 May 2002 on the technical specification for interoperability of the 'operation' subsystem of the trans-European high-speed rail system (OJ L 245, 12.9.2002, p. 370) and Corrigendum (OJ L 275, 11.10.2002, p. 11).

Commission Decision 2002/735/EC of 30 May 2002 on the technical specification for interoperability of the 'rolling stock' subsystem of the trans-European high-speed rail system (OJ L 245, 12.9.2002, p. 402) and Corrigendum (OJ L 275, 11.10.2002, p. 13).

(See Annex 3 for a list of the sales agents of the *Official Journal of the European Union*).

<sup>(3)</sup> Directive 1996/48/EC of the Council of 23 July 1996 on the interoperability of the trans-European high-speed rail system (OJ L 235, 17.9.1996, p. 6).

<sup>(4)</sup> The AEIF (Association européenne pour l'interopérabilité ferroviaire) has been designated as the 'joint representative body' (JRB) defined in Article 2(h) of Directive 96/48/EC. The AEIF membership comprised the UIC, UNIFE and UITP for the writing of the first version of the high-speed TSIs, published in Official Journal L 245 of 12 September 2002. Membership now also comprises UIRR and UIP. (See Annex 3 for Internet link and address.)



# CONTENTS

<b>1. INTRODUCTION</b>	11
1.1. SCOPE	11
1.2. TARGET AUDIENCE	12
1.3. CONTENT OF THE GUIDE	12
<b>2. DIRECTIVE 96/48/EC AND THE HIGH-SPEED TSIs</b>	13
2.1. OBJECTIVES OF DIRECTIVE 96/48/EC AND THE HIGH-SPEED TSIs	13
2.2. GENERAL PROVISIONS OF DIRECTIVE 96/48/EC	13
2.2.1. Article 1(2): Interoperability conditions	13
2.2.2. Article 2(b): Interoperability	13
2.2.3. Article 2(c): Subsystems	14
2.2.4. Article 2(d): Interoperability constituents	14
2.2.5. Article 5(2): Conformity with the TSIs	14
2.2.6. Article 5(4): Interoperable high-speed trains and other trains	15
2.2.7. Article 9: Placing on the market of interoperability constituents	15
2.2.8. Article 15: Placing into service and operation of structural subsystems	15
2.2.9. Annex I, point 2: Rolling stock covered by Directive 96/48/EC and the high-speed TSIs	15
2.3. THE TECHNICAL SPECIFICATIONS FOR INTEROPERABILITY (TSIs)	16
2.3.1. Structure and content of the TSIs	16
2.3.2. Development of the TSIs	17
2.4. REFERENCE TO STANDARDS AND OTHER EUROPEAN DIRECTIVES	17
2.4.1. Overview	17
2.4.2. Principles of the ‘new approach’ and ‘global approach’ directives	18
2.4.3. Principles as applied to Directive 96/48/EC and the related TSIs	18
2.4.4. Reference to European standards and other documents in the TSIs	20
2.4.5. Reference to other directives	20
2.5. THE REVISION PROCESS OF THE HIGH-SPEED TSIs OF DIRECTIVE 96/48/EC	21
2.6. QUESTIONS ABOUT THE HIGH-SPEED TSIs	22
<b>3. DEFINITIONS</b>	23
3.1. BASIC PARAMETER	23
3.2. CONFORMITY	23
3.3. SUITABILITY FOR USE	23
3.4. ASSESSMENT OF CONFORMITY	23
3.5. EXISTING RAIL SYSTEM	23
3.6. DEROGATION	23
3.7. SPECIFIC CASE	23
3.8. SUBSTITUTION IN THE FRAMEWORK OF MAINTENANCE	23
3.9. RENEWAL	24
3.10. UPGRADING	24
3.11. PLACING ON THE MARKET	24
3.12. PLACING INTO SERVICE	24

3.13.	INFRASTRUCTURE MANAGER .....	24
3.14.	RAILWAY UNDERTAKING .....	24
3.15.	INFRASTRUCTURE AND ROLLING STOCK REGISTERS .....	24
<b>4.</b>	<b>STAKEHOLDERS AND REGULATORY FRAMEWORK .....</b>	<b>27</b>
4.1.	MANUFACTURER .....	27
4.2.	CONTRACTING ENTITY .....	28
4.3.	AUTHORISED REPRESENTATIVE .....	28
4.4.	NOTIFIED BODIES .....	29
4.5.	APPLICABLE NATIONAL RULES .....	29
4.6.	MODULES EXPLANATION AND THEIR USE .....	30
4.6.1.	<i>Conformity assessment procedures</i> .....	30
4.6.2.	<i>Modules used in the TSIs</i> .....	31
4.6.3.	<i>Choice of assessment procedures and modules</i> .....	32
4.6.4.	<i>Interoperability constituent suitability for use assessment</i> .....	33
4.6.5.	<i>Assessments applicable to certain phases</i> .....	33
4.7.	PLACING OF AN INTEROPERABILITY CONSTITUENT ON THE MARKET .....	33
4.8.	PLACING A SUBSYSTEM INTO SERVICE .....	34
4.9.	LIFE CYCLE .....	35
<b>5.</b>	<b>APPLICABLE STANDARDS .....</b>	<b>37</b>
5.1.	SCOPE .....	37
5.2.	INFRASTRUCTURE SUBSYSTEM TSI .....	39
5.2.1.	<i>Standards or other documents referred to in the infrastructure TSI (and therefore mandatory)</i> .....	39
5.2.2.	<i>Standards or other documents not referred to in the infrastructure TSI (and therefore voluntary)</i> .....	39
5.3.	ENERGY SUBSYSTEM TSI .....	46
5.3.1.	<i>Standards or other documents referred to in the energy TSI (and therefore mandatory)</i> .....	46
5.3.2.	<i>Standards or other documents not referred to in the energy TSI (and therefore voluntary)</i> .....	49
5.4.	ROLLING STOCK SUBSYSTEM TSI .....	51
5.4.1.	<i>Standards or other documents referred to in the rolling stock TSI (and therefore mandatory)</i> .....	51
5.4.2.	<i>Standards or other documents not referred to in the rolling stock TSI (and therefore voluntary)</i> .....	52
5.5.	CONTROL-COMMAND AND SIGNALLING SUBSYSTEM TSI .....	59
5.5.1.	<i>Standards or other documents referred to in the control-command and signalling TSI (and therefore mandatory)</i> .....	59
5.5.2.	<i>Standards or other documents not referred to in the control-command and signalling TSI (and therefore voluntary)</i> .....	64
<b>ANNEX 1:</b>	<b>REFERENCES OF NATIONAL TRANSPOSITIONS OF DIRECTIVE 96/48/EC .....</b>	<b>67</b>
<b>ANNEX 2:</b>	<b>GENERAL ARCHITECTURE OF DIRECTIVE 96/48/EC AND THE HIGH-SPEED TSIs .....</b>	<b>69</b>

<b>ANNEX 3:</b>	<b>USEFUL INTERNET LINKS AND ADDRESSES .....</b>	<b>70</b>
	3.1. LIST OF THE SALES AGENTS OF THE <i>OFFICIAL JOURNAL OF THE EUROPEAN UNION</i> ...	70
	3.2. EUROPEAN LEGISLATION AND DOCUMENTS ON RAIL INTEROPERABILITY .....	70
	3.3. LIST OF HARMONISED STANDARDS RELEVANT TO DIRECTIVE 96/48/EC .....	70
	3.4. LIST OF THE BODIES NOTIFIED TO THE COMMISSION UNDER DIRECTIVE 96/48/EC .....	70
	3.5. FORMAT FOR THE INFRASTRUCTURE AND ROLLING STOCK REGISTERS .....	70
	3.6. INDICATIVE LIST OF REFERENCES TO NATIONAL RULES COMPLEMENTING THE HIGH-SPEED TSIS .....	70
	3.7. AEIF: EUROPEAN ASSOCIATION FOR RAILWAY INTEROPERABILITY .....	70
<b>ANNEX 4:</b>	<b>REVISION REQUEST APPLICATION FORM (EXAMPLE) .....</b>	<b>71</b>
<b>ANNEX 5:</b>	<b>STRUCTURE OF THE MODULES FOR INTEROPERABILITY CONSTITUENTS ASSESSMENT .....</b>	<b>72</b>
<b>ANNEX 6:</b>	<b>MANUFACTURER'S AND NOTIFIED BODY'S TASKS FOR INTEROPERABILITY CONSTITUENTS ASSESSMENT .....</b>	<b>73</b>
<b>ANNEX 7:</b>	<b>STRUCTURE OF THE MODULES FOR SUBSYSTEMS' 'EC' VERIFICATION .....</b>	<b>75</b>
<b>ANNEX 8:</b>	<b>CONTRACTING ENTITY'S AND NOTIFIED BODY'S TASKS FOR SUBSYSTEMS' 'EC' VERIFICATION .....</b>	<b>78</b>
<b>ANNEX 9:</b>	<b>THE EUROPEAN STANDARDISATION CONTEXT .....</b>	<b>81</b>
<b>ANNEX 10:</b>	<b>TERMINOLOGY RELATING TO CONFORMITY ASSESSMENT .....</b>	<b>82</b>
<b>ANNEX 11:</b>	<b>ELEMENTS TO BE MENTIONED ON THE CERTIFICATES AND OTHER FORMAL DOCUMENTS ISSUED BY NOTIFIED BODIES ...</b>	<b>84</b>
<b>ANNEX 12:</b>	<b>LIST OF ABBREVIATIONS AND ACRONYMS .....</b>	<b>87</b>



# 1. INTRODUCTION

## 1.1. Scope

The objective of this guide is to help clarify certain concepts and procedures referred to in Directive 96/48/EC on the interoperability of the trans-European high-speed rail system and the related technical specifications for interoperability (TSIs). In particular, the guide aims to explain how high-speed interoperability constituents and subsystems might be assessed with a view to meeting the essential requirements of Directive 96/48/EC.

So far as possible, Directive 96/48/EC has adopted the principle of the new-approach directives, laying down essential requirements and leaving it to standards, primarily European harmonised standards, to define technical requirements, adhered to on a voluntary basis, enabling the fulfilment of the essential requirements. However, due to the complexity of the rail system and of its integrated aspects regarding the essential requirements, it was necessary to set up TSIs to ensure the mandatory interoperability of the trans-European high-speed rail system.

The essential requirements are set out in general terms in Annex III to the directive; they are further elaborated upon for each subsystem in Chapter 3 of each of the TSIs. These subsystem-specific essential requirements are then reflected in the technical parameters, interfaces and performance requirements set out for each subsystem in Chapter 4 of the appropriate TSI. The standards (voluntary or obligatory, see Section 2.4.1 of this guide) mandated under Directive 96/48/EC enable in fact the fulfilment of the technical characteristics of the high-speed subsystems defined in Chapter 4 of the TSIs and not directly the essential requirements of the directive.

Directive 96/48/EC — which entered into force on 8 October 1996 — had to be transposed into national law by 8 April 1999 (Annex 1 lists national transpositions of the directive).

The decisions on the TSIs were adopted by the European Commission on 30 May 2002 and were notified to the Member States on the same date. The TSI provisions have been applicable since 1 December 2002.

This guide should be used in conjunction with the high-speed directive and the related TSI decisions <sup>(5)</sup>.

The guide constitutes an aide for the correct application of the high-speed TSIs that should lead to the removal of obstacles and difficulties related to the free circulation of interoperable <sup>(6)</sup> high-speed trains and equipment within the Community territory <sup>(7)</sup>. It is not intended to contain guidelines for designing or manufacturing railway equipment.

However, depending on the particular situation of each Member State, the TSIs allow the existence of specific cases, which, most of the time, are transitory situations accepted because their modification to a TSI-compliant situation is not currently economically justifiable.

---

<sup>(5)</sup> This document does not have a regulatory character; the provisions that it states cannot prevail on those of Directive 96/48/EC and the related TSIs.

<sup>(6)</sup> In the context of this guide, a constituent or a subsystem is said to be interoperable when covered by a valid 'EC' declaration of conformity or verification issued by the manufacturer or the contracting entity under Directive 96/48/EC.

<sup>(7)</sup> According to the agreement related to the European Economic Area (EEA) (Council and Commission Decision 94/1/EC of 13 December 1993 (OJ L 1, 3.1.1994, p. 1)) the territories of Liechtenstein, Iceland and Norway have to be considered, for the implementation of Directive 96/48/EC, as part of the Community territory. The territory of relevance is therefore composed of 18 States for the purposes of this directive. When the terms 'Community', 'Community territory' or 'single market' are used in this guide, EEA territory is meant.

## 1.2. Target audience

The aim of this guide is to facilitate the application of the high-speed TSIs by the Member States' regulatory authorities as well as by all the economic actors and agents concerned, such as the railway undertakings, infrastructure managers, equipment manufacturers, maintenance service providers, trade associations, contracting entities <sup>(8)</sup> and the notified bodies in charge of the assessment procedures of the interoperability constituents' conformity and/or suitability for use and the subsystems' 'EC' verification.

## 1.3. Content of the guide

In order to ensure transparency, this guide intends to assist all the relevant users concerned by the implementation of the TSI decisions. The guide is, *inter alia*, a synthesis of all the relevant information contained in the TSI presentation reports produced by the AEIF. In addition, the guide gives a complete picture, at the time of its writing, of the standardisation process related to the TSIs, presenting a complete list of the existing or draft European standards relating to the essential requirements of Directive 96/48/EC and/or to parameters covered by the TSIs, including those standards not explicitly referred to in the decisions.

---

<sup>(8)</sup> Directive 96/48/EC also uses the words 'awarding authority'. When the term 'contracting entity' is used in this guide, it covers both the terms 'contracting entity' or 'awarding authority' in the sense of the directive.

## 2. DIRECTIVE 96/48/EC AND THE HIGH-SPEED TSIs

Annex 2 to this guide shows the general architecture and organisation of the directive and its related TSIs.

### 2.1. Objectives of Directive 96/48/EC and the high-speed TSIs

The objectives of the directive and the related TSI decisions are the creation of a regulatory framework of mandatory TSIs and of voluntary or (where necessary) mandatory harmonised standards with the purpose of ensuring interoperability on the European high-speed network while meeting the directive's essential requirements, thereby helping to open up transport services and equipment contracts and enhancing the competitiveness of the railway sector overall.

### 2.2. General provisions of Directive 96/48/EC

With regard to its objectives, the following Articles of Directive 96/48/EC are of particular importance.

#### 2.2.1. Article 1(2): *Interoperability conditions*

'These (interoperability) conditions concern projects for and the construction, upgrading and operation of the infrastructures and rolling stock which will contribute to the functioning of the system to be put into service after the date of entry into force of this directive.'

Comments:

The TSIs were prepared with a view to allowing, in compliance with the essential requirements foreseen by the directive, the safe and uninterrupted movement of interoperable (see footnote 6 of Section 1.1) high-speed trains. Therefore, they do not deal with, for example, the conditions relevant to comfort requirements, which are not an impediment to the free and safe movement of the trains.

#### 2.2.2. Article 2(b): *Interoperability*

'“Interoperability” means the ability of the trans-European high-speed rail system to allow the safe and uninterrupted movement of high-speed trains which accomplish the specified levels of performance. This ability rests on all the regulatory, technical and operational conditions which must be met in order to satisfy the essential requirements.'

Comments:

In recent years, a number of new, high-speed trains have been brought into service on international routes. This has been achieved safely and with minimum disruption, but nearly all of these new trains achieved cross-border interoperability on an ad hoc, route-specific basis. In other words, these new trains relied on forms of interoperability that were not fully compliant with Directive 96/48/EC and its related TSIs. Typically, the rolling stock used on these international routes was specifically equipped for those routes with, for instance, multiple control systems allowing it to switch rapidly from one control system to another where necessary. These ad hoc solutions could entail additional production costs.

By way of contrast, Directive 96/48/EC and its related TSIs are designed to facilitate the eventual technical harmonisation of the entire trans-European high-speed rail system with a view to improving its competitiveness, for example, by lowering production, acceptance, operation and maintenance costs.

### **2.2.3. Article 2(c): Subsystems**

“Subsystems” means that the trans-European high-speed rail system is subdivided, as described in Annex II, into structural or functional subsystems for which essential requirements must be laid down.’

Comments:

Annex II to Directive 96/48/EC explains that, for the purposes of the directive, the high-speed rail system was subdivided into:

- four basically structural subsystems: infrastructure, energy, control-command and signalling, and rolling stock;
- four basically operational subsystems: maintenance, environment, operation and users.

The means by which subsystems must achieve interoperability are set out in documents called technical specifications for interoperability (TSIs), which are published as formal decisions of the European Commission and are therefore mandatory.

In the course of preparing the TSIs (see Section 2.3.2 below) and in accordance with Article 5(1) of the directive, it was found that the subsystems ‘environment’ and ‘users’ were better dealt with integrated in the TSIs for the other subsystems, leaving six TSIs.

### **2.2.4. Article 2(d): Interoperability constituents**

“Interoperability constituent” means any elementary component, group of components, sub-assembly or complete assembly of equipment incorporated or intended to be incorporated into a subsystem, upon which the interoperability of the trans-European high-speed rail system depends either directly or indirectly.’

Comments:

The interoperability constituents and their interoperable characteristics are determined by the TSIs.

One of the objectives of Directive 96/48/EC and the related TSIs is to create a European industrial market for railway products with the definition of interoperability constituents. To avoid the unnecessary repetition of assessment procedures and related costs, components or sub-assemblies of a subsystem necessary for interoperability, which are manufactured to an identical design as serial products, to be later sold in quantity and incorporated in subsystems, have been defined as interoperability constituents.

Generally speaking, interoperability constituents have the following common points.

- The interoperability constituent characteristics can be evaluated by reference to a European standard or another relevant document, independently of the subsystem in which the constituents will be integrated.
- Interoperability constituents can be used in isolation as spare parts and placed on the European market by the manufacturer, before their integration in a subsystem.
- Interoperability constituents are elements whose design can be developed individually.

The qualification of an interoperability constituent does not depend on the question of integration in a subsystem. However, in any case, it will be necessary to check if interoperability constituents are used in their area of use as intended in Chapter 5 of each high-speed TSI.

### **2.2.5. Article 5(2): Conformity with the TSIs**

‘The subsystems must conform to the TSI; this conformity must be permanently maintained while each subsystem is in use.’

Comments:

It is the responsibility of the Member State where the subsystem is located or operated to ensure this conformity is maintained after a subsystem was placed into service and while each subsystem is in use. The means for assessing conformity are mainly left to the discretion of this Member State.

#### **2.2.6. Article 5(4): Interoperable high-speed trains and other trains**

‘The TSIs shall not be an impediment to decisions by the Member States concerning the use of new or upgraded infrastructures for running other trains.’

Comments:

When drafting the TSIs, the simultaneous circulation on the same high-speed infrastructure of both interoperable (see footnote 6 of Section 1.1) high-speed trains and other trains, whether passenger or freight, was considered. This situation did not require individual specifications for this type of mixed traffic, insofar as the specifications retained for the majority of the high-speed subsystems’ basic parameters made it possible to adopt limit values compatible with the movement of other trains, without disturbing the circulation of interoperable high-speed trains. The choice of individual limit values remains, however, within the competence of the infrastructure manager who has to bear their economic impact and to verify their compatibility with the TSIs’ requirements.

#### **2.2.7. Article 9: Placing on the market of interoperability constituents**

‘Member States may not, in their territory and on grounds of this directive, prohibit, restrict or hinder the placing on the market of interoperability constituents for use in the trans-European high-speed rail system if they comply with the directive.’

Comments:

Free movement of goods is a cornerstone of the single market. Technical harmonisation, such as through the TSIs, is one of the mechanisms to achieve this aim.

#### **2.2.8. Article 15: Placing into service and operation of structural subsystems**

‘Member States may not, in their territory and on grounds of this directive, prohibit, restrict or hinder the construction, placing into service and operation of structural subsystems constituting the trans-European high-speed rail system which satisfy the essential requirements.’

Comments:

Article 15 is the extension to structural subsystems of the concept of free movement.

#### **2.2.9. Annex I, point 2: Rolling stock covered by Directive 96/48/EC and the high-speed TSIs**

‘The high-speed advanced-technology trains shall be designed in such a way as to guarantee safe, uninterrupted travel:

- at a speed of at least 250 km/h on the lines specially built for high speed, while enabling speeds of over 300 km/h to be reached in appropriate circumstances;
- at a speed of the order of 200 km/h on existing lines which have been or are to be specially upgraded;
- at the highest possible speed on other lines.’

Comments:

The current formulation of Directive 96/48/EC, Annex I, point 2, might be interpreted as if the rolling stock travelling at a speed of the order of 200 km/h on lines specially built for high speed is excluded from the scope of the directive, which is not the case.

However, the existence of this interpretation within the working group in charge of drafting the high-speed rolling stock TSI came to light somewhat late in the elaboration process of the TSI.

Faced with this situation, the Regulatory Committee extensively discussed the best course of action. It was decided, given the advanced stage of development of the rolling stock TSI, to adopt it in its current form and to precise its scope.

Therefore the high-speed rolling stock TSI, as published in the Official Journal of 12 September 2002, stipulates in its Section 1.1:

‘This TSI is applicable to trains running at a speed of at least 250 km/h on the lines specially built for high speed *and* at a speed of the order of 200 km/h on existing lines which have been or are to be specially upgraded. As far as trains running on upgraded lines at a speed of the order of 200 km/h and on other conventional lines are concerned, Article 2 of the present TSI decision is applicable as long as this case is not covered in the TSI revision process.’

This section makes clear that the high-speed rolling stock TSI, as published in the Official Journal of 12 September 2002, does not cover trains circulating at a speed of the order of 200 km/h on lines specially built for high speed.

These trains are nevertheless within the scope of Directive 96/48/EC. Therefore they have to comply with the relevant essential requirements and national rules, to be notified by each Member State to the Commission, that are applicable.

The next version of the high-speed rolling stock TSI, expected for 2005, will correct this situation and also cover rolling stock circulating at a speed of the order of 200 km/h on lines specially built for high speed.

The next version of the high-speed interoperability directive, which is part of the second ‘railway package’, will prevent interpretation on this aspect.

## **2.3. The technical specifications for interoperability (TSIs)**

### **2.3.1. Structure and content of the TSIs**

Section 2.2.3 above, dealing with subsystems, introduces the TSIs which set out the means by which those subsystems must achieve interoperability. To the extent necessary to achieve interoperability of the trans-European high-speed rail system, each TSI (cf. Directive 96/48/EC, Article 5(3)):

- (a) indicates its scope (Chapter 2 of the TSIs), for example, the part of network or rolling stock referred to in Annex I to the directive, the subsystem or part of subsystem referred to in its Annex II;
- (b) specifies the essential requirements for the subsystem concerned (Chapter 3 of the TSIs);
- (c) lists the subsystem’s basic parameters necessary to meet the essential requirements and its interfaces with the other subsystems (Chapter 4 of the TSIs). It also specifies the functional and technical specifications to be met by the subsystem and its interfaces to achieve specified performance for different categories of line, namely:
  - the lines specially built for high speed,
  - the lines specially upgraded for high speed,
  - the lines specially upgraded for high speed which have special features as a result of topographical, relief or town-planning constraints;
- (d) determines the interoperability constituents and their interfaces necessary to achieve interoperability within the trans-European high-speed rail system while meeting Directive 96/48/EC’s essential requirements (Chapter 5 of the TSIs). Where necessary, the interoperability constituents will be covered by European specifications (some of which already exist), including European standards;

(e) describes, in each case under consideration, the procedures for assessing the conformity or suitability for use of interoperability constituents and for performing the ‘EC’ verification of the subsystem (Chapter 6 of the TSIs). This includes, in particular, the relevant modules defined in Decision 93/465/EEC or, where appropriate, specific procedures.

‘The compliance of an interoperability constituent with the essential requirements shall be established in relation to any relevant European specifications that may exist’ (Directive 96/48/EC, Article 10(2)). ‘The verification of the interoperability, in accordance with the essential requirements, of a structural subsystem constituting the trans-European high-speed rail system shall be established by reference to the TSIs’ (Directive 96/48/EC, Article 16(2));

(f) describes implementing provisions in certain specific cases (Chapter 7 of the TSIs). In particular, recommendations are made concerning the time objectives for the transition from the existing to the final situation where full compliance with the TSIs will be the norm.

### **2.3.2. Development of the TSIs**

The high-speed TSI drafts were prepared by the AEIF on behalf of the European Commission.

The European Commission was assisted by a Regulatory Committee, composed of representatives of the Member States and chaired by a representative of the Commission, in accordance with Article 21 of Directive 96/48/EC.

During their development, successive drafts of the TSIs were presented to the Regulatory Committee, on average every three months, and the drafts were thoroughly discussed.

At the end of this process, the final versions were formally presented to the Regulatory Committee, which gave unanimously positive opinions on the six TSIs in December 2001.

## **2.4. Reference to standards and other European directives**

### **2.4.1. Overview**

The TSIs are published as decisions from the European Commission and are therefore mandatory. However, the TSIs allow for some optional provisions.

Where the TSIs specifically refer to or quote (part(s) of) European standards or other documents, compliance with those (part(s) of) standards or documents becomes mandatory.

Only those (part(s) of) standards and documents that are strictly necessary to achieve the interoperability of the trans-European high-speed rail system are specifically referred to or quoted in, and therefore mandated by, the TSIs. However, various other standards and documents are also relevant to the TSIs even though they are not referred to in the TSIs. Compliance with these standards (see Section 2.4.3.2 below) or documents remains voluntary. Compliance with harmonised standards will deliver an assumption of compliance with the corresponding essential requirements (see Section 2.4.2 below). As mentioned in Section 1.1, in practice the standards and other documents listed in Section 5 relate, for each subsystem, to the technical parameters, interfaces and performance requirements set out in Chapter 4 of each of the TSIs (and these technical parameters, etc, in turn, reflect the essential requirements of the directive and the subsystem-specific essential requirements set out in Chapter 3 of the TSIs).

Section 5 of this guide identifies, for each TSI:

- which (part(s) of) European standards and documents are mandatory (and therefore referred to in the TSI), and
- which other standards and documents are relevant to the TSI, but voluntary (and are not, therefore, referred to in the TSI).

In the absence of relevant European standards, relevant documents such as UIC leaflets are listed in Section 5 of this guide. These documents should be progressively replaced by European standards.

An up-to-date list reflecting the latest developments in the railway system standardisation process can be found on the Internet site of the European Commission (see Annex 3).

The first version of the high-speed TSIs (published in OJ L 245, 12.9.2002 and the corrigenda published in OJ L 275, 11.10.2002) does not fully describe how subsystems should meet the essential requirements of Directive 96/48/EC, in particular in the domain of safety for aspects pertaining also to conventional rail (see Section 2.5). Where there are gaps in the TSIs, and until those gaps are filled, Member States are allowed to continue to use existing national rules and the corresponding assessment procedures (see Section 4.5), provided these have first been notified to the European Commission (see Section 4.5). These notified national rules are not listed in this guide.

#### **2.4.2. Principles of the ‘new approach’ and ‘global approach’ directives**

The framework of rules designed to achieve interoperability is based on the principles of the ‘new approach’ and ‘global approach’ to Community regulations.

The new approach principles to technical harmonisation and standardisation were laid down by a Council resolution of 1985. This resolution established the following principles:

- legislative harmonisation is limited to essential requirements that products placed on the Community market must meet if they are to benefit from free movement within the Community;
- technical specifications that would enable products to meet the essential requirements set out in new approach directives are laid down in ‘harmonised’ standards (see Section 2.4.3.2 below), the reference numbers of which are published in the *Official Journal of the European Union*;
- compliance with ‘harmonised’ standards remains voluntary and manufacturers may always apply other technical specifications to meet the essential requirements, however;
- products manufactured in compliance with ‘harmonised’ standards benefit from a presumption of conformity with the corresponding essential requirements.

In addition to the new approach principles, it was necessary to establish uniform conditions for product conformity assessment. The 1989 Council resolution on the ‘global approach’ to certification and testing <sup>(9)</sup> set out guiding principles for Community policy on conformity assessment. To this end, Community legislation describes modules for the various phases of the conformity assessment procedures and lays down criteria for the use of these procedures and for the designation of bodies carrying out these procedures. (See *Guide to the implementation of directives based on the new approach and the global approach*, ISBN 92-828-7500-8, Office for Official Publications of the European Communities, 2000.)

#### **2.4.3. Principles as applied to Directive 96/48/EC and the related TSIs**

##### **2.4.3.1. TSIs and the ‘new approach’**

Compared to strictly ‘new approach’ directives, the TSIs represent an additional level between the directive’s ‘essential requirements’ and any corresponding standards, reflecting the complexity of the rail system and the need to integrate its various constituents while meeting the essential requirements.

---

<sup>(9)</sup> The global approach was completed by Council Decision 90/683/EEC and modified by Decision 93/465/EEC.

#### 2.4.3.2. Standardisation documents

The applicable legal definitions are the following:

- **in the context of the ‘new approach’:**

A ‘harmonised standard’ is a standard which has been:

- mandated by the Commission under a ‘new approach’ (or ‘new approach’-type) directive, and
- developed by the European standards organisations (CEN, Cenelec, ETSI) in accordance with the general internal rules of these organisations.

Such standards can be considered to carry a broad consensus.

The reference numbers of ‘harmonised’ standards are published in the *Official Journal of the European Union* (series C). ‘Harmonised’ standards are then transposed by Member States at national level.

- **in the context of Directive 96/48/EC (Directive 96/48/EC, Article 2(f)):**

“‘European specification’ means a common technical specification, a European technical approval or a national standard transposing a European standard, as defined in points 8 to 12 of Article 1 of Directive 93/38/EEC <sup>(10)</sup>”;

- **in the context of Directive 93/38/EEC (Directive 93/38/EEC, Articles 1(9), (10) and (11)):**

“‘Standard’ means a technical specification approved by a recognised standardising body for repeated or continuous application, compliance with which is in principle not compulsory;

“‘European standard’ means a standard approved by the European Committee for Standardisation (CEN) or the European Committee for Electrotechnical Standardisation (Cenelec) as a European standard (EN) or harmonisation document (HD), according to the common rules of those organisations, or by the European Telecommunications Standards Institute (ETSI) according to its own rules as a European telecommunications standard (ETS);

“‘Common technical specification’ means a technical specification drawn up in accordance with a procedure recognised by the Member States with a view to uniform application in all Member States and published in the *Official Journal of the European Union*.”

#### 2.4.3.3. Other documents

In addition to the standards referred to above, other documents relevant to the TSIs cover issues such as performance criteria, testing methods or product specifications.

#### 2.4.3.4. Strict/slipping references

References in the TSIs to existing standards or other documents can be either:

- ‘strict’ references — whereby the reference clearly identifies a particular version of the document (such as, with reference to the version number, date, etc.); or
- ‘slipping’ references (that is, with no clear identification of a particular version of the document) — whereby the reference is to the version of the document in force at the time of publication of the latest version of the TSI in question.

As far as possible, only strict references are made in the TSIs.

---

<sup>(10)</sup> Council Directive 93/38/EEC of 14 June 1993 coordinating the procurement procedures of entities operating in the water, energy, transport and telecommunications sectors (OJ L 199, 9.8.1993, p. 84), as amended by the 1994 Act of Accession.

#### **2.4.4. Reference to European standards and other documents in the TSIs**

As mentioned in Section 2.4.1, where the TSIs make specific reference to particular European standards or other relevant documents, compliance with those specifications or other documents is mandatory. Different situations may justify making such references in the TSIs, in particular where:

- the required interfaces or performance of specific constituents or subsystems can only be expressed with reference to precise technical characteristics which must be met if the constituents or subsystems are to be declared interoperable; or
- it is necessary to refer to the testing methods to be used to assess the conformity/suitability for use of a constituent or interface, or to perform the ‘EC’ verification of a subsystem. This is of particular relevance for the safety-critical parts of the railway system, recognising the ‘EC’ declaration of conformity or suitability for use or verification as essential to its safety certification.

These principles do not affect the general policy of the Community in favour of European standards. In particular, ‘... in order to comply with the appropriate provisions on government procurement procedures in the rail sector and in particular Directive 93/38/EEC, contracting entities must include technical specifications in the general documents or the contract documents relating to each contract; (to this end) ... it is necessary to build up a body of European specifications to serve as references for those technical specifications’ (see 15th recital of Directive 96/48/EC).

The TSIs make no reference to non-mandatory standards or other relevant documents.

#### **2.4.5. Reference to other directives**

All other directives intersecting the technical scope of Directive 96/48/EC, including subsystems and interoperability constituents, remain applicable so long as they do not relate to the essential requirements set out in Directive 96/48/EC. Where appropriate, the following provision in Directive 96/48/EC applies:

- Article 13(3): ‘Where the interoperability constituents are the subject of other Community directives covering other aspects, the ‘EC’ declaration of conformity or suitability for use shall, in such instances, state that the interoperability constituents also meet the requirements of those other directives.’

Where other Community legislation relates to the essential requirements set out in Directive 96/48/EC, the following provisions of Directive 96/48/EC apply:

- Article 3(2): ‘The provisions of this directive shall apply without prejudice to other Community provisions. However, in the case of interoperability constituents, compliance with the essential requirements of this directive may require the use of the individual European specifications drawn up for that purpose.’
- Annex VI (1): “‘EC’ verification is the procedure whereby a notified body checks and certifies, at the request of a contracting entity or its authorised representative established within the Community, that a subsystem:
  - complies with the directive;
  - complies with the other regulations deriving from the Treaty and may be put into operation.’

The manufacturer of an interoperability constituent is responsible for guaranteeing its conformity with the requirements of any relevant directives — to this end, and when necessary, the manufacturer must appoint bodies notified in accordance with those directives (see Annex 3 for the list of bodies notified under Directive 96/48/EC). However, a notified body appointed to assess the conformity of an interoperability constituent with Directive 96/48/EC and the high-speed TSIs does not have to assess that constituent’s conformity with other relevant directives.

The situation is different for a subsystem. The notified body, which performs the ‘EC’ verification, must verify that:

- the interoperability constituents are provided with the ‘EC’ declaration of conformity in accordance with Article 13 of the directive; and

- the subsystem complies with any other applicable regulations deriving from the Treaty. In this case, the notified body appointed by the contracting entity does not have to assess the conformity of the subsystem with the other regulations but shall verify that the subsystem has whatever ‘EC’ declarations are required by any applicable directives.

So far as possible, the TSIs took account of all applicable European legislation (for instance the EMC directive, 89/336/EEC). Where appropriate, and taking account of the principles outlined in Section 2.4.4 above, the TSIs refer to standards developed under other applicable legislation.

However, in the case of conflicting essential requirements of Directive 96/48/EC and of other directives covering the same technical scope, the matter should be brought to the attention of the Commission, which will seek the best appropriate solution. A legal principle that may apply in this case is that sector-specific legislation prevails over horizontal legislation.

## **2.5. The revision process of the high-speed TSIs of Directive 96/48/EC**

This guide was prepared for the first version of the high-speed TSIs (published in OJ L 245, 12.9.2002 and the corrigenda published in OJ L 275, 11.10.2002). Aspects that were not specific to high speed have not been dealt with in this first version. These aspects will be addressed within the context of the conventional rail directive, 2001/16/EC <sup>(1)</sup>. The resulting specifications will be progressively integrated, where appropriate, into the high-speed TSIs.

The TSIs revision process adheres to the following general principles:

- to ensure transparency;
- to take account of technological evolution;
- to maintain the coherence of the high-speed rail system;
- to ensure consistency between high-speed TSIs;
- to ensure a controlled and managed framework;
- to propose changes, after evaluation of their compliance with the essential requirements of Directive 96/48/EC as well as their economic impact.

The revision request author (RRA) can be the European Commission, a Member State, an infrastructure manager, a railway undertaking, a notified body or other TSI users.

The RRA should address the revision request to the joint representative body — currently the AEIF <sup>(12)</sup> — which is in charge of the coordination and follow-up of the revision process.

The revision request shall include:

- a clear identification of the author (group/name);
- a reference number;
- the subject, including, where applicable, the name of the document and the clause referred to;
- a description of the problem;
- possibly, a proposed solution.

<sup>(1)</sup> Directive 2001/16/EC of the European Parliament and of the Council of 19 March 2001 on the interoperability of the trans-European conventional rail system (OJ L 110, 20.4.2001, p. 1).

<sup>(12)</sup> AEIF: European Association for Railway Interoperability (See Annex 3 for Internet link and address). The European Rail Agency will replace the AEIF in this role when it takes up duty.

An example of a revision request application form is given in Annex 4.

The joint representative body will prepare the proposed solution in conformity with the prescriptions of the directive and of the mandate given by the European Commission. The proposed solution will be presented to the European Commission who shall take a decision in accordance with the procedure defined in Article 21(2) of Directive 96/48/EC.

All revision request authors will have access to the information relating to their requests.

## **2.6. Questions about the high-speed TSIs**

For Directive 96/48/EC and the high-speed TSIs to be totally effective, it is essential that all railway stakeholders in the Community share a common understanding and application of their content and requirements.

Even if this guide intends to provide guidance in implementing the high-speed TSIs, users will probably still face questions, which remain unanswered.

Bodies notified under Directive 96/48/EC may refer to their coordination group NB-Rail for any questions they may have regarding the assessment and verification procedures in relation with the implementation of the high-speed TSIs (see Section 4.4).

Other users may refer their questions to the joint representative body — currently the AEIF, until its role is taken over by the European Rail Agency expected to become operational in 2004–05.

Each question and its draft answer will be sent to the European Commission by the coordination group NB-Rail or the AEIF, which will also keep themselves mutually informed.

The European Commission shall give its opinion on the draft answer, where necessary in accordance with the procedure defined in Article 21(2) of Directive 96/48/EC. In all cases, the Committee, the coordination group NB-Rail and the AEIF will be kept informed of the procedure and the European Commission's opinion, for the two latter to act accordingly.

The questions, together with the answers, will be made publicly available on the websites of the European Commission, the coordination group NB-Rail and the AEIF.

## **3. DEFINITIONS**

### **3.1. Basic parameter**

Any regulatory, technical or operational condition which is critical to interoperability.

### **3.2. Conformity**

Fulfilment by a product of specified requirements.

### **3.3. Suitability for use**

Ability of an interoperability constituent to achieve and maintain a specified performance during its period of use.

### **3.4. Assessment of conformity**

Any activity concerned with determining directly or indirectly that specified requirements are fulfilled.

### **3.5. Existing rail system**

System composed of the existing railway infrastructures, comprising lines and fixed installations, plus the existing rolling stock of all categories and origin travelling on that infrastructure as well as the existing operating rules.

### **3.6. Derogation**

Under certain circumstances, described as derogations, projects can be exempted from having to comply with all or part of a TSI or TSIs (and notified national rules can apply instead — see Section 2.4.1 above and 4.5 below). The circumstances under which derogations might be awarded, and arrangements for considering and approving derogation requests, are set out in Article 7 of Directive 96/48/EC.

### **3.7. Specific case**

Any part of the trans-European high-speed rail system for which special provisions, either temporary or permanent, are foreseen in the TSIs because of geographical, topographical or urban environment constraints or those affecting compatibility with the existing system. This may include, in particular, railway lines and networks isolated from the rest of the Community, the track and loading gauge or the space between the tracks. These specific cases were identified during the development of the high-speed TSIs and are enshrined in the TSI decisions.

### **3.8. Substitution in the framework of maintenance**

Any replacement of components by parts of identical function and performance in the framework of preventive or corrective maintenance.

### **3.9. Renewal**

Any major substitution of a subsystem or part of a subsystem, which does not change the performance of the subsystem. In the case of a renewal (or maintenance-related replacement) application of the TSIs is voluntary (see Article 2 or Article 3 of the appropriate TSI decision).

### **3.10. Upgrading**

Any major modification of a subsystem or part of a subsystem, which changes the performance of the subsystem (see also Section 4.8 below).

### **3.11. Placing on the market**

The process by which an interoperability constituent is made available within the European Community, with a view to distribution or use within the Community (see Section 4.7 below).

### **3.12. Placing into service**

The process by which a structural subsystem is put into use in its designed state as set out in Article 14 of Directive 96/48/EC (see also Section 4.8 below).

### **3.13. Infrastructure manager**

Any body or undertaking responsible in particular for establishing and maintaining a railway infrastructure. This may also include the management of infrastructure control and safety systems (Council Directive 2001/12/EC <sup>(13)</sup> amending Council Directive 91/440/EEC).

### **3.14. Railway undertaking**

Any public or private undertaking licensed according to applicable Community legislation, the principal business of which is to provide services for the transport of goods and/or passengers by rail with a requirement that the undertaking must ensure traction; this also includes undertakings which provide traction only (Council Directive 2001/12/EC amending Council Directive 91/440/EEC).

### **3.15. Infrastructure and rolling stock registers**

An infrastructure or rolling stock register is a compilation of the relevant characteristics concerning the basic parameters, interfaces and performance of the infrastructure or the rolling stock. Typically, such registers would also contain information concerning control-command, energy, operation and maintenance.

The high-speed TSIs require (see the modules relative to the 'EC' verification of a subsystem in the relevant annex of each TSI) an infrastructure or rolling stock register (as appropriate) to be appended to the application for 'EC' verification lodged with a notified body.

---

<sup>(13)</sup> Directive 2001/12/EC of the European Parliament and of the Council of 26 February 2001 amending Council Directive 91/440/EEC on the development of the Community's railways (OJ L 75, 15.3.2001, p. 1).

Annex E to the infrastructure TSI and Annex I to the rolling stock TSI (as published in OJ L 245, 12.9.2002 and the corrigenda in OJ L 275, 11.10.2002) list elements to be mentioned in the registers, as a minimum.

Discussions to streamline requirements relative to registers from the interoperability directives in respect of similar requirements from the ‘infrastructure package’ (namely the network statement required by Directive 2001/14/EC <sup>(14)</sup>) were still under way at the time of writing the present guide. The reader should refer to the website of the European Commission for the latest information regarding the registers (see Annex 3).

---

<sup>(14)</sup> Directive 2001/14/EC of the European Parliament and of the Council of 26 February 2001 on the allocation of railway infrastructure capacity and the levying of charges for the use of railway infrastructure and safety certification (OJ L75, 15.3.2001, p.29).



# 4. STAKEHOLDERS AND REGULATORY FRAMEWORK

## 4.1. Manufacturer

This is the organisation responsible for the design and construction of an interoperability constituent covered by Directive 96/48/EC and the related TSIs, with a view to placing it on the market on the Community territory on his own behalf. In some cases, the contracting entity could be involved in the design of the interoperability constituent. An infrastructure manager or a railway undertaking can also be a manufacturer.

Whoever substantially modifies an interoperability constituent resulting in an ‘as-new’ interoperability constituent <sup>(15)</sup>, with a view to placing it on the market on the Community territory, becomes the manufacturer.

Comments:

The manufacturer bears responsibility for:

- the design and construction of the interoperability constituent;
- following the procedures for the certification of the conformity and suitability for use of the interoperability constituent with the requirements laid down in Directive 96/48/EC and the related TSIs.

The manufacturer has sole and ultimate responsibility for the conformity of its interoperability constituent with any applicable directives. He must understand both the design and construction of the interoperability constituent, arrange for EC certification by (a) notified bodies(y) and issue an ‘EC’ declaration of conformity or suitability for use in respect of all applicable provisions and requirements of the relevant directives.

The ‘EC’ declaration of conformity or suitability for use of an interoperability constituent must precisely identify its field of application (see Annex 11). When an interoperability constituent is to be used in a new field of application, its conformity must be reassessed for that new field of application. When the assessment of suitability for use is required for an interoperability constituent, the same rules must be applied when this constituent is used in a new field of application.

The manufacturer may subcontract certain operations — for instance, the interoperability constituent design or production — provided that he retains overall control and responsibility for the interoperability constituent as a whole. By the same token, he may use ready-made items or components, ‘EC’ marked or not, to produce the interoperability constituent without losing his status as a manufacturer.

Annex IV to Directive 96/48/EC defines the obligations incumbent upon the manufacturer with regard to the ‘EC’ declaration of conformity/suitability for use of an interoperability constituent.

The manufacturer may be based in the Community or elsewhere. In either case, the manufacturer may appoint an authorised representative (see Section 4.3) in the Community to act on his behalf in carrying out certain tasks required in the applicable directives. However, a manufacturer established outside the Community is not obliged to have an authorised representative, although this may present some advantages.

---

<sup>(15)</sup> That is, where the modifications could influence the characteristics of the basic parameters supported by the interoperability constituent.

## 4.2. Contracting entity

The contracting entity is the organisation responsible for the design, construction, implementation and operation of a subsystem with a view to placing it into service within the Community territory, for instance an infrastructure manager or a railway undertaking.

Comments:

The contracting entity is responsible for:

- the design, construction, implementation and operation of the subsystem. It has responsibility for a subsystem's design and construction, even if elements of the subsystem were designed and built by different manufacturers;
- arranging for the 'EC' checking procedure to be carried out by a notified body;
- drawing up the 'EC' declaration of verification of the subsystem;
- obtaining the authorisation of placing into service from the Member State within which the subsystem is located and/or operated.

The contracting entity can delegate or subcontract certain tasks related to a subsystem (such as its design, construction or maintenance) but it retains overall control and responsibility for the subsystem as a whole.

Annexes V and VI to Directive 96/48/EC define the obligations incumbent upon the contracting entity with regard to the 'EC' declaration of verification and the arrangements for holding this 'EC' declaration, together with the technical file accompanying it.

## 4.3. Authorised representative

This is the organisation expressly appointed by the manufacturer or by the contracting entity by a written mandate to act on his behalf in respect of certain manufacturer's or contracting entity's obligations. The extent to which the authorised representative may enter into commitments binding on the manufacturer or the contracting entity is determined in accordance with the mandate conferred on the authorised representative by the manufacturer or contracting entity.

As an example, the authorised representative could be appointed to request the conformity assessment in the Community territory, sign the 'EC' declaration of conformity/suitability for use or verification, and hold these documents and the technical file (where applicable) at the disposal of the competent authorities during the lifetime of the interoperability constituent or the subsystem.

Comments:

A manufacturer's or contracting entity's authorised representative must be established within the Community.

Commercial representatives of a manufacturer (such as authorised distributors), whether or not established inside the Community, are not to be confused with an authorised representative in the meaning of Directive 96/48/EC.

The authorised representative must respect the obligations incumbent upon the manufacturer or the contracting entity, as for example Annexes IV, V and VI to Directive 96/48/EC, which define the obligations with regard to conformity/suitability for use assessment and 'EC' verification, an 'EC' declaration of conformity/suitability for use or verification and the arrangements for holding the 'EC' declaration, together with the technical file, at the disposal of the competent authorities.

The authorised representative may be addressed by the authorities of the Member States instead of the manufacturer or the contracting entity with regard to the latter's obligations under Directive 96/48/EC. The manufacturer or the contracting entity remains responsible for actions carried out by an authorised representative on his behalf.

#### 4.4. Notified bodies

According to Articles 2(i), 13(2), 18 and 20 of Directive 96/48/EC, the notified bodies have the following tasks:

- to assess the conformity or suitability for use of the interoperability constituents;
- to undertake 'EC' verification of the subsystems.

These tasks are in accordance with the 'global approach' principles, as explained in Section 2.4.2 of this guide.

The *Guide to the implementation of directives based on the new approach and the global approach* (ISBN 92-828-7500-8, Office for Official Publications of the European Communities, 2000) is relevant to the activities of notified bodies appointed under Directive 96/48/EC, with the exception of the provisions dealing with the attachment of 'CE' markings to interoperability constituents and subsystems. A 'CE' marking, if any, affixed to an interoperability constituent or subsystem does not mean it complies with Directive 96/48/EC and the related TSIs; this only happens as a result of the application of other European directive(s) for technical harmonisation. Evidence of compliance with Directive 96/48/EC and the related TSIs must be sought in the relevant documentation.

In accordance with the 'global approach' principles, Directive 96/48/EC requires the notified bodies to closely cooperate with a view to coordinating their activities. For this purpose, a notified bodies coordination group, NB-Rail, has been set up to discuss any problems that may arise in relation to the assessment of the conformity or suitability for use of interoperability constituents and with the 'EC' verification of subsystems, and to propose solutions to these problems. Solutions adopted according the procedure described in Article 21 of Directive 96/48/EC become recommendations for use. RFUs do not supersede but complement Community legislation by giving additional support and information to the notified bodies on technical issues.

#### 4.5. Applicable national rules

The TSIs (as published in OJ L 245, 12.9.2002 and the corrigenda in OJ L 275, 11.10.2002) deal solely with features specific to high-speed interoperability. However, subsystems typically include other features as well and application of the TSIs alone is not sufficient to satisfy totally the essential requirements of Directive 96/48/EC.

It was agreed that, in due course, TSIs developed in accordance with Directive 2001/16/EC on the interoperability of the trans-European conventional rail system would take into account these aspects currently untreated.

However, the subsystems placed into service under Directive 96/48/EC already have to satisfy all the essential requirements of this directive.

It was therefore agreed that, during the transitional period when the aspects untreated by the 'high-speed' TSIs are not covered yet by the 'conventional' TSIs under development, the national rules, notified by each Member State under Article 16(3) of Directive 96/48/EC to the European Commission and to all the other Member States, would apply on its territory for the untreated aspects as a complement to the current TSIs in order to ensure the full compliance with the essential requirements. An indicative <sup>(16)</sup> list of the references of these national rules can be found at the European Commission website on rail interoperability (see Annex 3).

Under the Commission's decisions publishing the 'high-speed' TSIs, it is up to the Member States to designate the bodies responsible for assessing the compliance with the national rules, complementary to the TSIs, notified under Directive 96/48/EC.

---

<sup>(16)</sup> The list available at the European Commission website reflects the national rules notified by the Member States to the Commission. Where necessary, a Member State can amend the rules it notified. The list's purpose of ensuring a fair and non-discriminatory treatment of all stakeholders by making public the applicable national rules requires nevertheless certain stability. The European Commission will pay attention to this aspect.

In practice, verification of compliance with the essential requirements of Directive 96/48/EC is then carried out in each Member State, for the part of the national rules falling within the scope of Directive 96/48/EC and not treated by the TSIs, within the national procedures to obtain the authorisation for placing into service or, where necessary, within procedures specific to high-speed rail interoperability set up by the Member State concerned.

The need for such national rules will diminish as the TSIs are amended/developed and adopted for both high-speed and conventional interoperability.

Derogations and specific cases (see Sections 3.6 and 3.7) also constitute situations where certain aspects fall outside the scope of the high-speeds TSIs and whose assessment and verification must be defined. At the time of writing this guide, this issue was still under discussion at the Regulatory Committee of Directive 96/48/EC. The outcome of this discussion, when available, will be linked to the electronic version of this guide that can be found at the European Commission website.

## **4.6. Modules explanation and their use**

### ***4.6.1. Conformity assessment procedures***

#### ***4.6.1.1. Interoperability constituents***

Before it can be placed on the market (see Section 4.7 below), an interoperability constituent must carry an ‘EC’ declaration of conformity and/or suitability for use. This is issued by the manufacturer of the interoperability constituent (following certification by a notified body where appropriate).

With reference to the TSIs, relevant standards or other documents as necessary, the ‘EC’ declaration of conformity or suitability for use (see Annex 11) attests to the compliance of an interoperability constituent with the appropriate essential requirements.

Other characteristics of an interoperability constituent may be defined in a contractual way between the manufacturer and the purchaser, provided they do not contradict the requirements of the TSIs. A notified body does not need to assess these characteristics in the framework of Directive 96/48/EC.

A new ‘EC’ declaration of conformity is necessary for an interoperability constituent to be placed on the market when it is substantially modified (see footnote 15 to Section 4.1 above).

A new ‘EC’ declaration of suitability for use is also necessary when the constituent is used in a new field of application.

The entity placing the interoperability constituent on the market on the Community territory, be it the manufacturer, his authorised representative in the Community, importer or any other person, must retain at the disposal of the competent authority the ‘EC’ declaration of conformity and/or suitability for use and, where applicable, the technical file not attached to the declaration (see Annex 11). These documents shall be maintained by such entity at the disposal of the competent authorities for a period covering the lifetime of the last interoperability constituent placed on the market. This applies for interoperability constituents manufactured in the Community as well as those imported from a third country.

It is foreseen that these declarations will be registered at the European Railway Agency when it begins its duties.

In practice, interoperability constituents are manufactured more than once on the basis of the same design or type, to be incorporated in various different projects for subsystems. With this in mind, an ‘EC’ declaration of conformity and/or suitability for use is issued in advance and is not usually related to a specific project for a subsystem or subsystems.

An interoperability constituent carrying an ‘EC’ declaration of conformity and/or suitability for use can be incorporated into an associated subsystem without further assessment of its conformity. Subsequent assessment for an ‘EC’ declaration of verification of the subsystem (see Section 4.6.1.2 below) will determine

whether or not the interoperability constituent has been integrated correctly and is compatible with other interoperability constituents in that subsystem (in particular, the ‘EC’ verification process will check that interoperability constituents are used in their relevant area of use within each subsystem (see Section 4.1)).

#### 4.6.1.2. Subsystems

Before seeking authorisation from the appropriate Member State to place a subsystem into service (see Section 4.8 below) the contracting entity for that subsystem must:

- arrange for a notified body to undertake the ‘EC’ verification of the subsystem (see Annex VI to Directive 96/48/EC); and
- issue an ‘EC’ declaration of verification for the subsystem.

Assessments relating to an ‘EC’ declaration of verification are carried out for all projects for subsystems. Such projects might correspond with more than one of the structural subsystems defined in Annex II to Directive 96/48/EC; they might also cover parts of subsystems (such as, track, track-side, control-command onboard assembly, overhead line), or a combination of parts (for example, a trainset normally includes parts of the subsystems rolling stock, control-command (onboard equipment), energy (pantograph), etc.).

Conformity assessment leading to an ‘EC’ declaration of verification must be carried out for all such parts of subsystems. Each such part should be treated as a ‘subsystem’ in its own right. The assessment will also determine their integration (interface) within the subsystem as a whole, with other parts of the subsystem and with other subsystems.

#### 4.6.2. Modules used in the TSIs

The procedures for conformity or suitability for use assessment are based on the use of modules of conformity such as defined by Council Decision 93/465/EEC <sup>(17)</sup>.

However, for the purpose of the high-speed TSIs and in accordance with Article 5(3f) of Directive 96/48/EC, an adaptation was necessary concerning the different modules. More particularly, specific modules were prepared for the ‘EC’ verification of subsystems and for the suitability for use of the ‘EC’ declaration.

The modules, which are used for the conformity assessment requirements of Chapter 6 of the TSIs and the corresponding tasks incumbent upon the manufacturers, the contracting entities, and the notified bodies, are indicated in Annexes 5 to 8 <sup>(18)</sup> to this guide.

- Annex 5 gives the structure of the modules for interoperability constituents conformity assessment.
- Annex 6 summarises the tasks incumbent upon the manufacturers and notified bodies for interoperability constituents conformity assessment.
- Annex 7 gives the structure of the modules for subsystems’ ‘EC’ verification.
- Annex 8 summarises the tasks incumbent upon the contracting entities and the notified bodies for subsystems ‘EC’ verification.

---

<sup>(17)</sup> Council Decision 93/465/EEC of 22 July 1993 concerning the modules for the various phases of the conformity assessment procedures and the rules for the affixing and use of the CE conformity marking, which are intended to be used in the technical harmonisation directives (OJ L 220, 30.8.1993, p. 23).

<sup>(18)</sup> For the operation subsystem, the TSI defines and describes two specific modules: AE, applied by the railway undertaking, and DE, applied by the railway undertaking or the infrastructure manager. These specific modules are not included in the Annex.

### **4.6.3. Choice of assessment procedures and modules**

#### **4.6.3.1. Interoperability constituents assessment**

The degree of involvement required of a notified body (NB) in the interoperability constituents assessment procedure is different for each module.

Generally, a selection from at least two modules has been made: one module for manufacturers **without** a quality management system and one module for manufacturers **with** a quality management system. In this latter case, the quality management system shall be assessed by the NB. The quality system certifications issued by an accredited certification body will be taken into account by the notified body when these certifications apply to the interoperability constituent.

The choice of the specific modules (from the selection specified in the TSIs) to be applied in a given interoperability constituent assessment procedure lies with the manufacturer, which entrusts the assessment and certification procedure to an NB of its choice, where necessary.

To use modules D and H2 (which require a quality management system), the manufacturer involved in the design and/or manufacture of an interoperability constituent must operate a quality management system **specifically** applied for this.

Where a manufacturer does not have a quality management system, only modules A, B, C and F can be used for assessing the interoperability constituents.

Where the suitability for use procedure shall be applied, module V is indicated. Module V, if specified, is always complementary to the other conformity assessment modules chosen by the manufacturer.

If, for a given requirement of an interoperability constituent, an assessment is necessary only in the design and development phase (see Section 4.6.5 below), the TSIs specify at least a ‘minimum’ module in the production phase, which expresses also for this phase the responsibility of the manufacturer to declare conformity.

In this case, these ‘minimum’ modules for the interoperability constituent’s production phase are:

- A where module A is also specified for the design and development phase;
- C where module B is specified for the design and development phase; or
- H2 where module H2 is specified for the design and development phase.

#### **4.6.3.2. Subsystems assessment**

For the assessment of subsystems, the verification procedure has to be carried out in all cases by an NB, as required in Directive 96/48/EC.

The choice of modules (from the selection specified in the TSI) for application in a given assessment procedure lies with the contracting entity or its authorised representative (see Section 4.3), which requests the verification procedure.

For subsystems that are designed, manufactured, installed and final-tested using a quality management system, the modules SD and SH2 can be used. This implies that all the partners involved in the design, manufacture, installation and test (for instance both infrastructure manager and industry, if they are involved) shall operate a quality management system for the subsystem.

Where a contracting entity does not have a quality management system, only modules SB, SF and SG can be used for the subsystems’ ‘EC’ verification. However, if the contracting entity subcontracts some elements of the subsystem to a subcontractor, which operates a certified quality system, the notified body will take into account this certified quality system in the assessment procedure.

If, for a given requirement of a subsystem, an assessment is necessary only in the design and development phase (see Section 4.6.5 below), the TSIs specify at least a ‘minimum’ module in the production phase, which expresses also for this phase the responsibility of the contracting entity to declare ‘EC’ verification.

In this case the ‘minimum’ modules for the subsystem’s production phase are:

- SF where SB is specified for the design and development phase,
- SG where SG is also specified for the design and development phase, or
- SH2 where SH2 is specified for the design and development phase.

#### ***4.6.4. Interoperability constituent suitability for use assessment***

The suitability for use procedure applies to constituents most critical for the safety, availability or economy of the system (considering the 20th recital of Directive 96/48/EC). It is specified, in particular, for constituents of a new design or which are used in a new field of application.

The suitability for use assessment procedure cannot be carried out in isolation and must always be conducted as a complement to a conformity assessment procedure.

The suitability for use assessment procedure is carried out by operation or by use of the constituent in service, integrated representatively into the subsystem, over a specific operational time or running distance.

If permitted by the relevant standard(s), the suitability for use can be assessed by simulation methods (such as on a test bench or on a test circuit). The conditions of acceptance are specified in this(ese) standard(s).

#### ***4.6.5. Assessments applicable to certain phases***

The TSIs specify to which phases (design and development, or production) the assessments of conformity apply and by which specific assessment methods (design review, type test, manufacturing process review, validation of in-service experience, etc.) it will be carried out. The choice of the modules depends on those phases.

For some basic parameters, only design characteristics (such as dimension requirements ensuring compatibility) are essential. In those cases, the conformity assessment is focused on a design review of the interoperability constituent or the subsystem.

Other characteristics (such as performance requirements) require in most cases an assessment and verification of the interoperability constituent and subsystem in the prototype or type test phases or in the series production phase, which are then specified in the annexes to the TSIs.

### **4.7. Placing of an interoperability constituent on the market**

‘Member States shall take all necessary steps to ensure that interoperability constituents:

- are placed on the market only if they enable interoperability to be achieved within the trans-European high-speed rail system while at the same time meeting the essential requirements;
- are used in their area of use as intended and are suitably installed and maintained.

These provisions shall not obstruct the placing on the market of these constituents for other applications.’ (Directive 96/48/EC, Article 8).

Comments:

The placing of an interoperability constituent on the market is the initial action, which typically takes place when the constituent leaves the manufacturing stage, of making this constituent available for the first time on the Community territory, with a view to its distribution or use in the Community.

An interoperability constituent can be made available either for payment or free of charge, typically by physical handover or by transfer of ownership to the importers established in the Community, the authorised distributors or directly to the final users, regardless of the legal instrument upon which the transfer is based (sale, loan, hire, leasing or any other type of legal instrument).

An interoperability constituent must comply with the directive and the high-speed TSIs when placed on the market. As the concept of placing on the market refers to each individual interoperability constituent — not to a type of constituent and regardless of being manufactured as an individual unit or in series — the manufacturer must ensure that every such high-speed interoperability constituent complies with Directive 96/48/EC and the related TSIs at its placing on the market.

If a manufacturer, his authorised representative in the Community or the importer offers an interoperability constituent covered by Directive 96/48/EC and the related TSIs in a catalogue, it is deemed not to have been placed on the market until it is actually made available for the first time. Therefore interoperability constituents offered in a catalogue would not have to be in full conformity with the provisions of the high-speed directive and the related TSIs, but this fact must be clearly advertised in the catalogue.

The placing of an interoperability constituent on the market does not concern:

- the disposal of the interoperability constituent from the manufacturer to his authorised representative established in the Community who is responsible on behalf of the manufacturer for ensuring compliance with the high-speed directive and the related TSIs;
- imports into the Community for the purpose of re-export, that is, under processing arrangements;
- the manufacture in the Community of an interoperability constituent for export to a third country;
- the display of the interoperability constituent at trade fairs and exhibitions. In this case, it may not be in full conformity with the provisions of the high-speed directive and the related TSIs, but this fact must be clearly advertised next to the interoperability constituent being exhibited.

#### **4.8. Placing a subsystem into service**

‘Each Member State shall authorise the placing in service of those structural subsystems constituting the trans-European high-speed rail system which are located in its territory or operated by a railway undertaking established there.

For this purpose, Member States shall take all necessary steps to ensure that these subsystems may be placed into service only if they are designed, constructed, installed and/or operated in such a way as not to hinder satisfaction of the essential requirements concerning them when integrated into the trans-European high-speed rail system.’ (Directive 96/48/EC, Article 14)

Comments:

In accordance with Article 18 of Directive 96/48/EC, the contracting entity or its authorised representative (see Section 4.3) makes an ‘EC’ declaration of verification on the basis of an ‘EC’ verification certificate delivered by a notified body and the technical dossier accompanying the certificate. For instance, the manufacturer of the subsystem acting as the contracting entity’s authorised representative can deliver the ‘EC’ declaration of verification.

The Member State where the subsystem will be operated can then authorise the placing into service of the subsystem provided with this ‘EC’ declaration of verification and the accompanying technical dossier.

The obligation for a subsystem to conform to the directive begins with its first placing into service after the entry into force of the directive and must be verified at each subsequent placing into service. In addition this compliance shall be permanently maintained while each subsystem is in use.

In the case of an upgrading, the contracting entity will submit a dossier describing the project to the Member State concerned. Based on the dossier and taking into account the implementation strategy in Chapter 7 of the TSIs, the Member State will decide (where appropriate) whether the scale of the work requires the need for a new authorisation for placing into service under Article 14 of Directive 96/48/EC. In particular the Member State can specify, where appropriate, the characteristics of the subsystem that have to be submitted to a new design examination and/or type test, for example, when only (a) part(s) of a subsystem is(are) changed. In this case, the dossier must justify the list of components to be checked. Such authorisation for placing into service is necessary whenever the level of safety may objectively be affected by the work envisaged.

In the case of renewal and maintenance-related replacement, application of the TSIs is voluntary.

Regardless of Directive 96/48/EC, the railway undertaking must also obtain a safety certificate in each of the Member States where it operates, in accordance with Article 32 of Directive 2001/14/EC <sup>(19)</sup>, which does not foresee the intervention of a notified body.

## **4.9. Life cycle**

As indicated in Article 18(2) of Directive 96/48/EC, the involvement of the notified bodies starts at the design stage and finishes immediately before the placing into service of a subsystem.

To constitute the technical file accompanying the declaration of 'EC' verification, the notified body is responsible for collecting (see Directive 96/48/EC, Article 18(3)) all the supporting documents relating to the upkeep, continuous or periodic monitoring, adjustment and maintenance instructions.

Under Directive 96/48/EC, the notified body is not responsible for verifying that these prescriptions are maintained in perpetuity by the entity for which it carried out the verification. This role is allocated to each Member State which authorised the subsystem's placing into service (Directive 96/48/EC, Article 14).

---

<sup>(19)</sup> Directive 2001/14/EC of the European Parliament and of the Council of 26 February 2001 on the allocation of railway infrastructure capacity and the levying of charges for the use of railway infrastructure and safety certification (OJ L 75, 15.3.2001, p. 29).



# 5. APPLICABLE STANDARDS

## 5.1. Scope

This part of the guide lists standards and other documents relevant to the design and conformity assessment of subsystems and interoperability constituents. The documents listed below include standards that cover performance criteria, testing methods or product specifications.

Sections 5.2 to 5.5 below list, for each TSI, two groups of documents:

- the standards or other documents which are specifically referred to in the TSIs and which are therefore mandatory; and
- other standards and documents which are relevant to the TSI, but which are not mandatory and are not, therefore, referred to in the TSI.

In accordance with the principle of the ‘new approach’ and the ‘global approach’ to technical harmonisation (see Section 2.4.2 above), products manufactured in compliance with any harmonised European standards listed below benefit from a presumption of conformity with the corresponding essential requirements of Directive 96/48/EC.

In the absence of European standards, the following tables refer to other specifications such as national rules and UIC leaflets. These documents will be replaced by European standards in due course.

The tables correspond with those parts of the TSIs which refer to, or are concerned with, European standards or other relevant documents (usually Chapter 4 and/or Chapter 5 of the TSIs) and with the TSI annexes which set out the interoperability constituents assessment and subsystems verification procedures, that is:

- Annexes A and B to the infrastructure subsystem TSI;
- Annexes B and C to the energy subsystem TSI;
- Annexes D and E to the rolling stock subsystem TSI;
- Annex A to the control-command and signalling subsystem TSI.

Annex 9 to this guide gives a brief description of the European standardisation context.

Annex 10 to this guide gives a common definition for the most important terms used in the context of the high-speed Directive 96/48/EC.

---

**Useful abbreviations:**

EN	European standard
ESO	European Standardisation Organisations (CEN, Cenelec and ETSI)
prEN	draft European standard
TS	technical specification
ENV	European pre-standard (will normally be called a TS in the future)
TR	technical report
CEN 00256...	CEN standard project: item of work in a standard programme, intended to lead to a new, amended or revised standard
CLC .....	Cenelec standard project: item of work in a standard programme, intended to lead to a new, amended or revised standard (NB: Contrary to the other two ESOs, ETSI directly allocates a standard number to a project.)
ISO	International Organisation for Standardisation
IEC	International Electrotechnical Commission
UIC leaflet	specification developed by the International Union of Railways
UIC code	catalogue listing all the UIC leaflets available
Unisig subset	specification developed by a group of manufacturers and railways involved in the development and implementation of ERTMS

---

## 5.2. Infrastructure subsystem TSI

### 5.2.1. Standards or other documents referred to in the infrastructure TSI (and therefore mandatory)

TSI sections	Characteristics	Mandatory standards or other documents
4.3.3.26 4.2.3.27	Protection against electric shocks	EN50122-1:1997 — Railway applications — Fixed installations — Protective provisions relating to electrical safety and earthing (Sections 4 and 5)
4.3.3.3(a) Annex D.2.2	Aerodynamic effects on structure calculations	ENV1991-3:1995 — Basis of design and actions on structures — Part 3: Traffic load on bridges (NB: This document will be updated and published under ref. EN1991-2:2003 Eurocode 1: Actions on structures Part 2: Traffic loads on bridges)
4.3.3.13 4.3.3.14 4.3.3.15 Annex D.2.2	Vertical load, transverse horizontal load, longitudinal load on structures	ENV1991-3:1995 ENV1991-1:1994 — Eurocode 1: Basis of design and actions on structures — Part 1: Basis of design
Annex C		EN ISO 9001:2000 — Quality management systems — Requirements

### 5.2.2. Standards or other documents not referred to in the infrastructure TSI (and therefore voluntary)

#### 5.2.2.1. Interoperability constituents

##### RAILS ON PLAIN LINE TRACK AND IN SWITCHES AND CROSSINGS

TSI sections	Characteristics	Relevant standards or other documents
5.2.1	Railhead profile Minimum mass Steel grade	For plain line rails, EN13674-1:2003 — Railway applications — Track — Rail — Part 1: Vignole railway rails 46 kg/m and above (TC 256 SC 1 WG 4),  For rails specific to switches and crossings: prEN13674-2 — Railway applications — Track — Rail — Part 2: switch and crossing rails used in conjunction with flat-bottom symmetrical railway rails 46 kg/m and above (current draft of TC 256 SC1 WG 4, document N1216 dated October 1997). (NB: An upgraded prEN13674-2 will be circulated beginning of 2003.)
4.3.3.10	Track gauge	prEN13848-1 (March 2003) — Railway applications — Track — Track geometry quality — Part 1: Characterisation of track geometry (CEN/TC 256 SC 1 WG 28)

*RAIL FASTENING SYSTEMS*

<b>TSI sections</b>	<b>Characteristics</b>	<b>Relevant standards or other documents</b>
5.2.2	<p>Minimum resistance: — to rail longitudinal slip — to repeated loading</p> <p>Electrical resistance</p> <p>In-service behaviour</p> <p>Dynamic stiffness of the rail pad</p>	<p>EN13481:2002 — Railway applications — Track — Performance requirements for fastening systems: Part 1: Definitions Part 2: Fastening systems for concrete sleepers Part 5: Fastening systems for slab track</p> <p>EN13146:2002 — Railway applications — Track — Test methods for fastening systems: Part 1: Determination of longitudinal rail restraint Part 4: Effect of repeated loading Part 5: Determination of electrical resistance Part 8: In-service testing <sup>(1)</sup></p> <p>Test method: Annex B to EN13481-2:2002 or Test method: Annex B to EN13481-5:2002</p>

<sup>(1)</sup> Calling for the tests to be performed on a line on which the running speed of the fastest trains is at least 160 km/h and the heaviest axle load of the rolling stock at least 170 kN, where at least one third of the fastening systems tested are laid on curves.

*TRACK SLEEPERS AND BEARERS*

<b>TSI sections</b>	<b>Characteristics</b>	<b>Relevant standards or other documents</b>
5.2.3	Mass and dimensions	EN13230-1:2002 — Railway applications — Track — Concrete bearers and sleepers — Part 1: General requirements

TSI sections	Characteristics	Relevant standards or other documents
5.2.4	<p>Switch rail profile</p> <ul style="list-style-type: none"> <li>• functional gauges in S&amp;C design</li> <li>• cant deficiency in diverging track</li> </ul>	<p>draft prEN13803-2 — Railway applications — Track — Track alignment design parameters — Standard track: Part 2: Switches and crossings</p> <p>(first stable draft of TC 256 SC 1 WG 15, expected August 2003).</p> <p>prEN13232-4 (September 2002) — Railway applications — Track — Switches and crossings — Part 4: Actuation, locking and detection</p> <p>prEN13232-5 (October 2002) — Railway applications — Track — Switches and crossings — Part 5: Switches</p> <p>prEN13232-6 (October 2002) — Railway applications — Track — Switches and crossings — Part 6: Fixed common and obtuse crossings (TC 256 SC 1 WG 18)</p> <p>draft prEN13232-7 — Railway applications — Track — Switches and crossings — Part 7: Crossings with movable parts (document in preparation within TC 256 SC 1 WG 18 for public enquiry and expected September 2003)</p> <p>draft prEN13232-9 — Railway applications — Track — Switches and crossings — Part 9: Layouts (document in preparation within TC 256 SC 1 WG 18 for public enquiry and expected September 2003).</p> <p>UIC leaflet 716, Sects 4–5: Maximum permissible wear profiles for switches (1st edition of 1 January 1986)</p> <p>prEN13674-2 — Railway applications — Track — Rail, Part 2: switch and crossing rails used in conjunction with flat-bottom symmetrical railway rails 46 kg/m and above (current draft of TC 256 SC 1 WG 4, document N1216 dated October 1997).</p> <p>UIC leaflet 510-2, Sect. 3: Trailing stock — Conditions concerning the use of wheels of various diameters with running gear of different types (3rd edition in course of preparation)</p>

### 5.2.3.2 Parameters of the infrastructure subsystem

#### DOMAIN: CIVIL ENGINEERING (GENERAL)

TSI sections	Characteristics	Relevant standards or other documents
4.3.3.7	Track cant	ENV13803-1:2002 — Railway applications — Track — Track alignment design parameters — Standard track — Part 1: Plain line
4.3.3.8	Radius of curvature	ENV13803-1:2002
4.3.3.5	Vertical and lateral radius of curvature of stabling tracks	UIC leaflet 527-1 — Coaches, vans and wagons — Dimensions of buffer heads – Track layout on S-curves (2nd edition of 1 January 1981 and four amendments)  UIC leaflet 505-1 — Railway transport stock — Rolling stock construction gauge (9th edition in course of preparation)
4.3.3.2	Track centres distance	UIC leaflet 505-4 — Effects of the application of the kinematic gauges defined in the 505 series of leaflets on the positioning of structures in relation to the tracks and of the tracks in relation to each other (3rd edition of 1 January 1977 and two amendments)
4.3.3.23	Effects of cross winds	EN14067-2:2003 — Railway applications — Aerodynamics — Part 2: Aerodynamics on open track directly to ‘cross winds effects’  (NB: This standard refers to the prEN14067-4: Railways applications — Aerodynamics — Part 4: Requirements and test procedures for aerodynamics on open track (in progress).)  Other document to be considered: prEN1991-1-4 (WI 00250089) — Action on structures, Parts 1–4: Action on structures — Wind actions.

#### DOMAIN: CIVIL ENGINEERING (STATIONS, GENERAL)

TSI sections	Characteristics	Relevant standards or other documents
4.3.3.26	Platform height	UIC leaflet 741 — Passenger stations — Height of platforms (3rd edition of 1 January 1993)

*DOMAIN: UNDERGROUND STATIONS*

<b>TSI sections</b>	<b>Characteristics</b>	<b>Relevant standards or other documents</b>
Annex B.3	Minimum curve radius of stabling tracks and S-shaped alignments	UIC leaflet 527-1 — Coaches, vans and wagons — Dimensions of buffer heads — Track layout on S-curves (2nd edition of 1 January 1981 and four amendments)  UIC leaflet 505-1 — Railway transport stock — Rolling stock construction gauge (9th edition in course of preparation)
4.1.1 4.3.3.1	Clearance gauge	UIC leaflet 506 — Rules governing application of the enlarged GA, GB and GC gauges (1st edition of 1 January 1987 and four amendments)  UIC leaflet 505-4 — Effects of the application of the kinematics gauges defined in the 505 series of leaflets on the positioning of structures in relation to the tracks and of the tracks in relation to each other (3rd edition of 1 January 1977 and two amendments)
Energy TSI	Pantograph gauge	UIC leaflet 606-1 — Consequences of the application of the kinematics gauges defined by UIC leaflets in the 505 series on the design of the contact lines (1st edition of 1 January 1987 and one amendment)  UIC leaflet 505-1  UIC leaflet 505-4

*DOMAIN: STRUCTURES (ROAD BRIDGES)*

<b>TSI sections</b>	<b>Characteristics</b>	<b>Relevant standards or other documents</b>
4.1.1 4.3.3.1	Clearance gauge	UIC leaflet 506 (1 January 1987 edition) and 505-4 (1 January 1977 edition)
Energy TSI	Pantograph gauge	UIC leaflets 606-1, 505-1 and 505-4

DOMAIN: TUNNELS AND CUT- AND COVERS

TSI sections	Characteristics	Relevant standards or other documents
4.1.1.1 4.3.3.1	Clearance gauge	UIC leaflet 506 (1 January 1987 edition) and 505-4 (1 January 1977 edition)
Energy TSI	Pantograph gauge	UIC leaflets 606-1, 505-1 and 505-4
4.3.3.6	Free air cross section calculation  Aerodynamic characteristics	UIC leaflet 779-11 — Determination of railway tunnel cross-sectional areas on the basis of aerodynamic considerations — 1st edition of 1 January 1995 — Chapters 4, 5 and 6  prEN14067-4 — Railway applications — Aerodynamics — Part 4: Requirements and test procedures for aerodynamics on open track  prEN14067-5 — Railway applications — Aerodynamics — Part 5: Requirements and test procedures for aerodynamics in tunnel  (In preparation in TC 256 WG 6 for public enquiry in August 2003.)

DOMAIN: SUPERSTRUCTURE (PLAIN TRACK)

TSI sections	Characteristics	Relevant standards or other documents
4.3.9 4.3.3.11 4.3.3.21	Equivalent conicity Rail inclination Resistance of the track, switches and crossings to braking and acceleration forces	Standards are needed in order to transpose the basic requirements into harmonised solutions
4.3.3.10	Track gauge; theoretical reference value	prEN13848-1 (March 2003) — Railway applications — Track — Track geometry quality — Part 1: Characterisation of track geometry (document developed by CEN/TC 256 SC 1 WG 28)
4.3.3.16 4.3.3.17	Resistance of the track, switches and crossings to vertical loads Resistance of the track, switches and crossings to lateral loads	These verifications shall be made only if the corresponding components do not have an interoperability constituent's declaration of conformity. See above, the standards listed in interoperability constituents 'Rails on plain line track and in switches and crossings', 'Rail fastening systems', 'Track sleepers and bearers', 'Switches and crossings' (Section 5.2.2.1 of this guide)  prEN14363 (June 2002) — Railway applications — Testing of running behaviour and stationary (current draft of TC 256 WG 10, dated June 2002)
4.3.3.22	Track stiffness	See above, the standards listed in Interoperability constituents, 'Rail fastening systems' (Section 5.2.2.1 of this guide)
6.3.1	In-service behaviour	EN13146-8:2002 — Railway applications — Track — Test methods for fastening systems: Part 8: In-service testing

*DOMAIN: SUPERSTRUCTURE (SWITCHES AND CROSSINGS)*

<b>TSI sections</b>	<b>Characteristics</b>	<b>Relevant standards or other documents</b>
4.3.3.20	Functional conditions: <ul style="list-style-type: none"> <li>• type of S &amp; C: (movable point crossing)</li> <li>• locking devices</li> <li>• type of S &amp; C: (cant deficiency in diverging track)</li> <li>• functional dimensions (cf. maintenance plan)</li> <li>• mechanical conditions: switch rail profile</li> </ul>	These verifications shall be made only if the corresponding components do not have an interoperability constituent's declaration of conformity. See above, the standards listed in interoperability constituents 'Switches and crossings' (Section 5.2.2.1 of this guide)  No document defining functional dimensions and assessment procedures available at the time of writing this guide.

*DOMAIN: SUPERSTRUCTURE (PLAIN TRACK AND SWITCHES AND CROSSINGS)*

<b>TSI sections</b>	<b>Characteristics</b>	<b>Relevant standards or other documents</b>
4.2.3.2.2	Maintenance plan fixing of track geometry standards	prEN13848-1 (March 2003) — Railway applications — Track — Track geometry quality — Part 1: Characterisation of track geometry (Document developed by CEN/TC 256 SC 1 WG 28)
4.3.3.18	Track geometrical quality	prEN14363 (June 2002) — Railway applications — Testing for the acceptance of running characteristics of railway vehicles — Testing of running behaviour and stationary (current draft of TC 256 WG 10, dated June 2002)

*DOMAIN: MISCELLANEOUS EQUIPMENT*

<b>TSI sections</b>	<b>Characteristics</b>	<b>Relevant standards or other documents</b>
4.1.1 4.3.3.1	Clearance gauge	UIC leaflet 506 — Rules governing application of the enlarged GA, GB and GC gauges (1st edition of 1 January 1987 and four amendments)  UIC leaflet 505-4 — Effects of the application of the kinematic gauges defined in the 505 series of leaflets on the positioning of structures in relation to the tracks and of the tracks in relation to each other (3rd edition of 1 January 1977 and two amendments)
Energy TSI	Pantograph gauge	UIC leaflets 606-1 — Consequences of the application of the kinematic gauges defined by UIC leaflets in the 505 series on the design of the contact lines (1st edition of 1 January 1987 and one amendment)  UIC leaflet 505-1 — Railway transport stock — Rolling stock construction gauge (9th edition in course of preparation)  UIC leaflet 505-4

### 5.3. Energy subsystem TSI

#### 5.3.1. Standards or other documents referred to in the energy TSI (and therefore mandatory)

##### 5.3.1.1. Interoperability constituents

###### OVERHEAD CONTACT LINE

TSI sections	Characteristics	Mandatory standards or other documents
4.1.2.1 4.1.2.2 5.3.1.1 5.3.1.3	Geometry AC Geometry DC Overall design Basic parameters	EN50119:2001 — Railway applications — Fixed installations — Electric traction overhead contact lines
5.3.1.2	Current capacity	EN50119:2001, Annex B  EN50149:1999 — Railway applications — Fixed installations — copper and copper alloy grooved contact wires for overhead contact lines (point 4.5, Tables 3 and 4)  (NB: This document has been updated and published under ref. EN50149:2001 — Railway applications — Fixed installations — Electric traction — Copper and copper alloy grooved contact wires for overhead contact lines.)
5.3.1.4	Wave propagation speed	EN50119:2001 (point 5.2.1.4)
5.3.1.5	Elasticity and uniformity of elasticity	EN50119:2001 (point 5.2.1.3)
5.3.1.8	Current at standstill	EN50119:2001 EN50206-1:1998 — Railway applications — Rolling stock — Pantographs: Characteristics and tests — Part 1: pantograph for main-line vehicles (point 6.13)

PANTOGRAPH

TSI sections	Characteristics	Mandatory standards or other documents
5.3.2.1	Overall design	EN50206-1:1998
5.3.2.4 Annex N	Design of insulation	EN50124-1:1999 — Railway applications — Insulation coordination — Part 1: Clearance and creepage distances for all electrical and electronic equipment  EN60383 — Insulator for overhead lines with a nominal voltage above 1 kV — Part 1(1996) and Part 2 (1995)  EN50215:1999 — Railway applications — Testing of rolling stock after completion of construction and before entry into service  EN50160:1999 — Voltage characteristics of electricity supplied by public distribution systems
5.3.2.6	Static contact force	EN50206-1:1998
5.3.2.7 Annex Q	Mean contact force and interaction performance of the overhead line/pantograph system	EN50117:2002 — Railway applications — Current collection systems — Requirements for and validation of measurements of the dynamic interaction between pantographs and overhead contact line  IEC 50811-33-02 <sup>(1)</sup>  EN50119:2001
5.3.2.8	Automatic dropping devices	EN50206-1:1998 (point 4.9)
5.3.2.9 Annex Q	Current at standstill	EN50206-1:1998 (point 6.13)  EN50117:2002  IEC 50811-33-02 <sup>(1)</sup>  EN50119:2001
Annex J	Profile of transitional collector head	prEN50367 (March 2002) — Railway applications — Current collection systems — Technical criteria for the interaction between pantograph and overhead line  EN50119:2001 (point 5.2.8.2)

<sup>(1)</sup> The standard is wrongly indicated in the TSI, the correct reference is: IEC 60050:1984 — International Electrotechnical Vocabulary — Chapter 811: Electric traction.

CONTACT STRIP

TSI sections	Characteristics	Mandatory standards or other documents
5.3.3.5	Detection of contact strip breakage	EN50206-1:1998 (point 4.9)

### 5.3.1.2. Parameters of the energy subsystem

<b>TSI sections</b>	<b>Characteristics</b>	<b>Mandatory standards and other documents</b>
4.1.1 Annex N	Voltage and frequencies	EN50160:1999 — Voltage characteristics of electricity supplied by public distribution systems  EN50215:1999 — Railway applications — Testing of rolling stock after completion of construction and before entry into service (point 9.15)
4.2.2.11	System separation sections	EN50119:2001
4.3.1.2 4.3.2.2	Safety, earthing and bonding	EN50119:2001 — Railway applications — Fixed installations — Electric traction overhead contact lines (point 5.1.2)  EN50122-1:1997 — Railway applications — Fixed installations — Electrical supply and earthing systems — Part 1: Protective provisions relating to electrical safety and earthing (points 5, 7, 9)
4.3.1.5	External electromagnetic compatibility	EN50122 series — Railway applications — Electrical supply and earthing systems for public transport equipment and ancillary apparatus  EN50121-2:2000 — Railway applications — EMC Part 2: Emission of the whole railway system to the outside world
4.3.1.8	Protection against electric shock	EN50122-1:1997 (points 5, 7, 9)
4.3.2.3 Annex Q	Dynamic behaviour and quality of current collection	EN50119:2001 — Railway applications — Fixed installations — Electric traction overhead contact lines (point 5.2.1.2)  EN50117:2002 IEC 50811-33-02 (NB: This standard is wrongly indicated in the TSI, the correct reference is: IEC 60050:1984 — International Electrotechnical Vocabulary — Chapter 811: Electric traction.)

### 5.3.1.3. Others

<b>TSI sections</b>	<b>Characteristics</b>	<b>Mandatory standards and other documents</b>
Annex A		EN ISO 9001:2000 — Quality management system — Requirements
Annex E		EN50123-1:1995 — Railway applications — Fixed installations — DC switchgear — Part 1: General

### 5.3.2. Standards or other documents not referred to in the energy TSI (and therefore voluntary)

#### 5.3.2.1. Interoperability constituents

##### OVERHEAD CONTACT LINE

TSI sections	Characteristics	Relevant standards or other documents
5.3.1.8	Current at standstill	prEN50367 (March 2002) — Railway applications — Current collection systems — Technical criteria for the interaction between pantograph and overhead line
4.1.1	Voltage and frequency	prEN50163 (December 2001) — Railway applications — Supply voltage of traction systems (current draft of CLC TC 9X SC C WG 11, dated December 2001)

##### PANTOGRAPH

TSI sections	Characteristics	Relevant standards or other documents
4.1.2.3 5.3.2.2	Geometry of collector head	EN50206-1:1998 — Railway applications — Rolling stock — Pantographs: Characteristics and tests — Part 1 pantograph for main line vehicles  prEN50367 (March 2002)
5.3.2.4	Design of insulation	EN60383-1:1996 — Insulator for overhead lines with a nominal voltage above 1 kV — Part 1: Ceramic or glass insulator units — Definitions, test methods and acceptance criteria + Amendment A11:1999  EN60383-2:1995 — Insulator for overhead lines with a nominal voltage above 1 kV — Part 2: Insulator strings and insulator sets for AC systems — Definitions, test methods and acceptance criteria  prEN50163 (December 2001) — Railway applications — Supply voltage of traction systems (current draft of CLC TC 9X SC C WG 11, dated December 2001)
4.3.2.5	Static contact force	prEN50367 (March 2002)
5.3.2.7	Mean contact force and interaction performance	EN50206-1:1998 prEN50367 (March 2002)
5.3.2.7	Alternative contact force stipulations	prEN50367 (March 2002)
5.3.2.8	Current at standstill	prEN50367 (March 2002)
4.1.1	Voltage and frequency	prEN50163 (December 2001)

<b>TSI sections</b>	<b>Characteristics</b>	<b>Relevant standards or other documents</b>
5.3.3.1	Basic parameter, length of contact strip	prEN50367 (March 2002)
5.3.3.2	Material	prEN50367 (March 2002)
5.3.3.3	Current capacity	prEN50367 (March 2002)
5.3.2.9	Current at standstill	prEN50367 (March 2002)

#### 5.3.2.2. Parameters of the energy subsystem

<b>TSI sections</b>	<b>Characteristics</b>	<b>Relevant standards and other documents</b>
4.1.1	Voltage and frequencies	prEN50163 (December 2001) — Railway applications — Supply voltage of traction systems (current draft of CLC TC 9X SC C WG 11, dated December 2001)
4.1.2.1 4.1.2.2	Geometry of overhead contact line	EN50119:2001 — Railway applications — Fixed installations — Electric traction overhead contact lines  prEN50367 (March 2002) — Railway applications — Current collection systems — Technical criteria for the interaction between pantograph and overhead line
4.1.2.1 4.1.2.2	Gradient of contact wire	EN50119:2001
4.2.2.8	Electrical protection coordination with RS subsystem	prEN50388 (June 2002) — Railway applications — Power supply and rolling stock — technical criteria for the coordination between power supply (substation) and rolling stock to achieve interoperability (current draft of CLC TC 9X SC C WG 11 dated June 2002)  UIC leaflet 796 — Voltage at the pantograph (1st edition 2000)  UIC leaflet 797 — Coordination of electrical protection substations/traction units (1st edition, April 2000)
4.2.2.10	Phase separation sections	prEN50388 (June 2002)
4.2.2.11	System separation sections	prEN50367 (March 2002)
4.3.1.1	Mean useful value of the voltage on a supply area	prEN50388 (June 2002)  UIC leaflet 796, 1st edition 2000
4.3.1.4	Regenerative braking	prEN50388 (June 2002)
4.3.2.3	Dynamic behaviour and quality of current collection	prEN50367 (March 2002)

## 5.4. Rolling stock subsystem TSI

### 5.4.1. Standards or other documents referred to in the rolling stock TSI (and therefore mandatory)

#### 5.4.1.1. Interoperability constituents

TSI sections	Characteristics	Mandatory standards and other documents
5.4/4.2.19	In service maintenance Internal power sockets	EN60309-1:1999 — Plugs, socket-outlets and couplers for industrial purposes — Part 1: General requirements  EN60309-2:1999 — Plugs, socket-outlets and couplers for industrial purposes — Part 2: Dimensional interchangeability requirements for pin and contact-tube accessories (NB: The rolling stock TSI refers to the maintenance TSI, Sections 5.3.4 and 5.2.2.3, which quote the related standards.)  EN50153:2002 — Railway applications — Rolling stock — Protective provisions relating to electrical hazards (clause 8.3.1 and 8.3.1.1)

#### 5.4.1.2 Parameters of the rolling stock subsystem

##### BASIC PARAMETERS

TSI sections	Characteristics	Mandatory standards or other documents
4.1.7	Mechanical boundary characteristics	
4.1.7a	Static resistance (vertical/longitudinal)	EN12663:2002 — Railway applications — Structural requirements of railway vehicles bodies
4.1.8	Boundary characteristics outside noise	prEN ISO 3095 (January 2001) — Railway applications — Acoustics — Measurement of noise emitted by railbound vehicles (current draft of TC 256 WG 3, dated January 2001)
4.1.9	Boundary characteristics linked to electromagnetic interference	
4.1.9.1	Interference to signalling system	EN50238:2003 — Railway applications — Compatibility between rolling stock and train detection systems
4.1.9.3	Radio frequency interference	EN50121-3-1:2000 — Railway applications — EMC — Part 3-1: Rolling stock — Train and complete vehicle
4.1.9.4	Electromagnetic immunity	EN50121-3-1:2000 and EN50121-3.2:2000 — Railway applications — EMC — Part 3.2: Rolling stock — Apparatus
4.1.12	Characteristics linked to carriage of disabled persons	ISO 7193:1985 — Wheelchair — Maximum overall dimensions

*SPECIFIED PERFORMANCE*

<b>TSI sections</b>	<b>Characteristics</b>	<b>Mandatory standards or other documents</b>
4.3.12	Environmental conditions	EN50125-1:1999 — Railway applications — Environmental conditions for equipment — Part 1: Equipment on board rolling stock
4.3.17	Protection against electrical shocks	EN50153:2002 — Rolling stock — Protective provisions relating to electrical hazards
4.3.20	Passengers information signs	ISO 7001:1990 — Public information symbol

**5.4.2. Standards or other documents not referred to in the rolling stock TSI (and therefore voluntary)**

**5.4.2.1. Interoperability constituents**

<b>TSI sections</b>	<b>Characteristics</b>	<b>Relevant standards or other documents</b>
5.4/4.2.9.a	End coupler	EN____(CEN00256157 WG 33) — Railway applications — Spare coupler — Performance requirements, specific interface geometry and test methods (No document available yet)
	Emergency coupler	EN____(CEN00256157 WG 33)
5.4/4.2.10.c	Wheel profile	prEN13715 (September 1999) — Railway applications — Wheelset and bogies — Wheels — Rim profile (current draft of TC 256 SC 2 WG 11, dated September 1999)  UIC leaflet 518 — Testing and approval of railway vehicles from the point of view of their dynamic behaviour — Safety — Track fatigue — Ride quality (2nd edition in course of preparation)
5.4/4.2.10.d	Wheel material	EN13260:2003 — Railway applications — Wheelset and bogies — Wheelsets — Product requirements (TC 256 SC 2 WG 11) EN13262:2003 — Railway applications — Wheelset and bogies — Wheel — Product requirements (TC 256 SC 2 WG 11).
5.4/4.2.10.e	Electrical resistance	Take into account Appendix 1 to Annex A to TSI control-command and signalling
5.4/4.2.20	Lights and horn: Devices	EN____(in development)  UIC leaflets: 532 — Trailing stock — Signal lamp brackets — Coaches — Fixed electric signal lamps (9th edition of 1 January 1979) 534 — Signal lamps and signal-lamp brackets for locomotives, railcars and all tractive and self-propelled stock (4th edition, August 2002) 651 — Layout of driver's cabs, railcars, multiple unit trains and driving trailers (4th edition, July 2002) 644 — Warning devices used on tractive units employed on international services (2nd edition — 1980)

<b>TSI sections</b>	<b>Characteristics</b>	<b>Relevant standards or other documents</b>
5.4/4.3.19	Wind screen <ul style="list-style-type: none"> <li>• optical quality</li> <li>• ability to resist impacts</li> </ul>	EN____(in development) UIC leaflets 564-1 — Coaches — Windows made from safety glass (6th edition of 1 January 1979) and 651

#### 5.4.2.2. Parameters of the rolling stock subsystem

##### BASIC PARAMETERS

<b>TSI sections</b>	<b>Characteristics</b>	<b>Relevant standards or other documents</b>
4.1.1	Maximum track forces	
4.1.1a	Dynamic vertical load	prEN14363 June 2002 — Railway applications — Testing for acceptance of running characteristics of railway vehicles — Testing of running behaviour and stationary (current draft of TC 256 WG 10, dated June 2002) (NB: This document deals with the interaction between rolling stock and infrastructure. Therefore, it should also be mentioned in Section 4.2.10 and in the basic parameters, Sections 4.1.1 and 4.1.2, of the rolling stock TSI.)  UIC leaflet 518 — Testing and approval of railway vehicles from the point of view of their dynamic behaviour — Safety — Track fatigue — Ride quality (2nd edition of 1 October 1999)
4.1.1b	Transversal track forces	prEN14363 (June 2002)
4.1.1c	Longitudinal track forces	EN____(in development)
4.1.2	Static axle load	prEN14363 (June 2002)  EN____(CLC/WI 13466: CLC project developed by CLC TC 9X SC B WG 5 is taking into account the requirements for interoperability on testing of rolling stock after completion of construction and before entry into service)
4.1.4	Vehicle kinematics gauge	EN____(CEN/WI 00256150 to 153 WG 32) — Railway applications — Requirements for the kinematics gauge — Part 1-4: Rolling stock construction gauge  UIC leaflets:  505-1 — Railway transport stock — Rolling stock construction gauge (9th edition in course of preparation)  505-4 — Effects of the application of the kinematics gauges defined in the 505 series of leaflets on the positioning of structures in relation to the tracks and of the tracks in relation to each other (3rd edition of 1 January 1977 and two amendments)  505-5 — Basic conditions common to Leaflets 505-1 to 505-4 — Notes on the preparation and provisions of these leaflets (2nd edition of 1 January 1977 and four amendments)

TSI sections	Characteristics	Relevant standards or other documents
		<p>506 — Rules governing application of the enlarged GA, GB and GC gauges (1st edition of 1 January 1987 and four amendments)</p> <p>606-1 — Consequence of the application of the kinematics gauges defined by UIC leaflets in the 505 series on the design of the contact lines (1st edition of 1987)</p> <p>608 — Condition to be complied with for the pantographs of tractive units used on international trains (2nd edition of 1989)</p>
4.1.5	Minimum braking characteristics	<p>EN____(CEN/WI 00256140,1,2, WG 22) — Railway applications — Braking systems of HS trains</p> <ul style="list-style-type: none"> <li>— Part 1: General requirements and definitions</li> <li>— Part 2: Performance requirements</li> <li>— Part 3: Test methods</li> </ul> <p>prEN14531-6 — Railway applications — Braking — Methods for calculation of stopping and slowing distances — Method for calculation of immobilisation braking — Part 1: application to HS trains (CEN/WI 00256149 WG 25)</p> <p>Reduced wheel–rail adhesion: UIC leaflets:</p> <p>541-05 — Brakes — Regulations concerning the construction of the various brake components — Wheel slip prevention equipment (1st edition of 1 January 1985 and eight amendments)</p> <p>544-1 – Brakes — Braking power (3rd edition of 1 January 1966 and nine amendments)</p> <p>Friction coefficient of brake pad/disc reduced by humidity: UIC leaflets:</p> <p>541-03 — Brakes — Regulations concerning manufacture of the different brake parts — Driver’s brake valve (1st edition of 1 January 1984)</p>
	Minimum deceleration	UIC leaflet 544
	Maximum braking distance	EN50215:1999
4.1.6	Electrical boundary characteristics	(see also standards for energy TSI)
4.1.6.1	Voltage and frequency variations in the electrical supply	prEN50163 (December 2001) — Railway applications — Supply voltage of traction systems (current draft of CLC TC 9X SC C WG 11, dated December 2001)
4.1.6.2	Maximum power demand	prEN50388 (June 2002) — Railway applications — Power supply and rolling stock — Technical criteria for the coordination between power supply (substation) and rolling stock to achieve interoperability (current draft of CLC TC 9X SC C WG 11 dated June 2002)
4.1.6.3	Power factor	prEN50388 (June 2002)

<b>TSI sections</b>	<b>Characteristics</b>	<b>Relevant standards or other documents</b>
4.1.6.4	Short over-voltages generated	prEN50388 (June 2002)  EN50124-2:2001 — Railway applications — Insulation coordination — Part 2: Over-voltage and related protection
4.1.7	Mechanical boundary characteristics	EN12663:2002 — Railway applications — Structural requirements of railway vehicles bodies
4.1.7b	Crashworthiness	EN____(CEN/00256123 WG 2) — Railway applications — Passive safety — Full-size crash test and numerical simulation requirements (under development in TC 256 WG 2)
4.1.10	Boundary characteristics linked to inside noise in drivers cab	prEN ISO 3381 (January 2001) — Railway applications — Measurement of noise inside railbound vehicles (current draft of TC 256 WG 3, dated January 2001)
4.1.11	Boundary characteristics linked to air conditioning	EN____(CEN/00256097 and 098) — Railway applications — Air conditioning for driving cabs  Part 1: Comfort parameters  Part 2 — Type tests (under development in TC 256 WG 8)  EN13129-1:2002 — Railway applications — Air conditioning for main-line rolling stock — Part 1: Comfort parameters  EN13129-2:2002 (July 2003) — Railway applications — Air conditioning for main-line rolling stock — Part 2: Type tests
4.1.12	Characteristics linked to carriage of disabled persons	UIC leaflet 565-3 — Indications for the layout of coaches suitable for conveying disabled passengers in their wheelchairs  1st edition of 1 January 1987 — Reprint dated 1 July 1997 and one amendment  Standards are needed in order to transpose the basic requirements of COST 335 into harmonised solutions
4.1.13	Max. pressure variations in tunnels	prEN14067-5 — Railway applications — Aerodynamics — Part 5: Requirements and tests procedures for aerodynamics in tunnels (under development in TC 256 WG 6)
4.1.14	Starting, operating, stopping in maximum gradients	To be included in the future revision of EN50215 EN____(CLC/WI 13466: CLC project developed by CLC TC 9X SC B WG 5 is taking into account the requirements for interoperability on testing of rolling stock after completion of construction and before entry into service)

TSI sections	Characteristics	Relevant standards or other documents
4.2.2	Driver vigilance device	EN to be developed by Cenelec  UIC 641 — Conditions to be fulfilled by automatic vigilance devices used in international traffic; 4th edition, February 2001
4.2.3	Electrification system	For electrically powered interoperable trainsets, the principal interface elements between the rolling stock and the energy subsystem are defined in the energy TSI
	Maximum power drawn from catenary	prEN50388 (June 2002) — Railway applications — Power supply and rolling stock — technical criteria for the coordination between power supply (substation) and rolling stock to achieve interoperability (current draft of CLC TC 9X SC C WG 11, dated June 2002)
	Voltage and frequency of supply	prEN50163 (December 2001) — Railway applications — Supply voltage of traction systems (current draft of CLC TC 9X SC C WG 11, dated December 2001)
	Over-voltages caused by harmonics	prEN50388 (June 2002)
	Electrical protection measures	prEN50388 (June 2002)
	Distribution of pantographs	prEN50367 (June 2002) — Railway applications — Current collection systems — Technical criteria for the interaction between pantograph and overhead line (current draft of CLC TC 9X SC C WG 9, dated June 2002)
	Running through phase separations	prEN50367 (June 2002)
	Running through system separations	EN50119:2001 — Railway applications — Fixed installations — Electric traction overhead contact lines  prEN50367 (June 2002)
	Pantograph contact forces	EN50317:2002 — Railway applications — Current collection systems requirements for and validation of measurements of the dynamic interaction between pantographs and overhead contact line  EN50206-1:1998 — Railway applications — Rolling stock — Pantographs: Characteristics and tests — Part 1: Pantograph for main-line vehicles  prEN50367 (June 2002)
	Power factor	prEN50388 (June 2002)
	Regenerative braking	prEN50388 (June 2002)
4.2.10	Wheel/rail contact	EN_____ to be developed (CEN/WI standard 00256129 (TC 256 WG 10))

<b>TSI sections</b>	<b>Characteristics</b>	<b>Relevant standards or other documents</b>
4.2.11	Hot box detection Validation of the system interface with existing trackside systems	EN____(CEN00256158 WG —) — Railway applications — Hot box detectors — Performance requirements
4.2.12	Emergency alarm	UIC leaflet 660  (EN___ CEN00256144 WG 24) — Railway applications — Passenger alarm subsystem — Part 1: Pneumatic system
4.2.16	Flange lubrication	EN_____to be developed
4.2.17	Suspension coefficient	EN____(CEN/00256140, 141 & 142, WG 22), prEN14531-6  UIC leaflet 505-5  EN____(CEN/0026150-153 WG 32)
4.2.20	External lights and horn	EN_____ (developed by a CEN project team)  UIC leaflets:  532 — Trailing stock — Signal lamp brackets — Coaches — Fixed electric signal lamps (9th edition of 1979)  534 — Signal lamps and signal brackets for locomotives, railcars and all tractive and self-propelled stock (4th edition of August 2002)  651 — Layout of driver's cabs, railcars, multiple unit trains and driving trailers (4th edition of July 2002)  644 — Warning devices used on tractive units employed on international services (2nd edition of 1980)

*SPECIFIED PERFORMANCE*

<b>TSI sections</b>	<b>Characteristics</b>	<b>Relevant standards or other documents</b>
4.3.6	Brake system requirements	UIC leaflet 660  EN____(CEN/00256140, 141 & 142 WG 22)
	Regenerative braking characteristics	prEN50388 (June 2002) — Railway applications — Power supply and rolling stock — Technical criteria for the coordination between power supply (substation) and rolling stock to achieve interoperability (current draft of CLC TC 9X SC C WG 11 dated June 2002)
	Brake fault diagnostics	EN__(CEN/00256145 WG 24) — Railway applications — Brake indicators (No document available yet)
4.3.7	Service braking performance	EN50215:1999  EN____(CLC/WI 13466) (CLC project developed by CLC TC 9X SC B WG 5 taking into account the requirements for interoperability on testing of rolling stock after completion of construction and before entry into service)  EN____(CEN/00256142 WG 22) (No document available yet)

<b>TSI sections</b>	<b>Characteristics</b>	<b>Relevant standards or other documents</b>
4.3.10	Detection of derailment	EN___(CEN/00256130 WG 10) — Railway applications — Wheel/rail interaction — Protection against derailment (No document available yet)
4.3.11	Fire and fumes protection	UIC leaflet 564-2 — Regulation relating to fire protection and firefighting measures in passenger carrying railway vehicles used on international services (3rd edition of 1991)  UIC leaflet 642 — Special provisions concerning fire protection and firefighting measures on motive units and driving trailers in international traffic (2nd edition, September 2001)
4.3.15	Emergency lighting	EN13272:2001 — Railway applications — Electrical lighting for rolling stock in public transport systems
4.3.17	Protection against electrical shocks	To be included in the future revision of EN50215  EN50153:2002 — Railway applications — Rolling stock — Protective provisions relating to rolling stock  UIC leaflet 533 — Protection by the earthing of metal parts of vehicles (2nd edition of 1977)
4.3.18	Driver's cab b — External visibility	EN_____(under development)  UIC leaflet 651
4.3.19	Wind screen characteristics	UIC leaflet 564-1 — Coaches — Windows made from safety glass (6th edition of 1 January 1979 — Reprint dated 1 January 1990)  UIC leaflet 651 — Layout of driver's cabs in locomotives, railcars, multiple-unit trains and driving trailers (4th edition of July 2002)  EN_____(under development)

## 5.5. Control-command and signalling subsystem TSI

The standards and other documents useful in the control-command TSI are defined in Annex A to the TSI.

This annex specifies the references of specifications, which must be fully applied, without alternative solutions and gives the references of informative documents useful for the control-command implementation. The references of the standards will be updated in the next version of the TSI, particularly for the conformity assessment of the interoperability constituents and parameters of the subsystem.

### 5.5.1. Standards or other documents referred to in the control-command and signalling TSI (and therefore mandatory)

#### 5.5.1.1. Interoperability characteristics of the control-command and signalling subsystem

##### GLOBAL REQUIREMENTS

TSI sections	Characteristics	Mandatory standards or other documents
4.1.1 (Index 0a)	ETCS FRS	UIC ETCS FRS Version 4.29 — 05 2002 EEIG 99E5362 Version 2.00 — 03 2002
4.1.1 (Index 0b)	GSM-R FRS	EIRENE FRS Version 5.0 — 03 2002

##### SAFETY

TSI sections	Characteristics	Mandatory standards or other documents
3.2.1 4.1.1 (Indexes 1, 2a)	Safety requirements	ESROG (ERTMS safety requirements and objectives group)  ENV50129 (May 1998) — Railway applications — Safety-related electronic systems for signalling (NB: ENV50129 also refers to standards EN50159-1 and EN50159-2)
3.2.1 3.2.2a (Index 2b)	Reliability, availability, maintainability and safety	EN50126:1999 — Railway applications — The specification and demonstration of reliability, availability, maintainability and safety (RAMS)
3.2.2b	Quality of maintenance	EN ISO 9001:2000 — Quality management systems — Requirements

*ENVIRONMENTAL PROTECTION (EMC)*

<b>TSI sections</b>	<b>Characteristics</b>	<b>Mandatory standards or other documents</b>
3.2.5.1.1 4.2.1.2d (Index 3)	Environmental physical conditions	EN50125-1:1999 — Railway applications — Environmental conditions for equipment — Part1: Equipment on board rolling stock  EN50155:1995 — Railway applications — Electronic equipment used on rolling stock (NB: EN50155:2001 and Amendment AA:2002 have been published)
3.2.5.1.2 4.2.1.2d (Index 4a)	Electromagnetic compatibility	For on-board equipment:  EN50121-3-2:2000 — Railway applications — Electromagnetic compatibility — Part 3-2: Rolling stock — Apparatus (Tables 4 and 6 in Clause 7. Clauses 4, 5 and 6 are applicable for testing procedures.) (Tables 7, 8 and 9 in Clause 8. Clauses 4, 5 and 6 are applicable for testing procedures.)  For testing equipment:  EN50121-4:2000 — Railway applications — Electromagnetic compatibility — Part 4: Emission and immunity of the signalling and telecommunications apparatus (Clauses 5 and 6)
3.2.5.1.2b 4.2.1.2f (Index 4b)	Immunity characteristics of train detection systems	

5.5.1.2. Control-command functions

<b>TSI sections</b>	<b>Characteristics</b>	<b>Mandatory standards and other documents</b>
4.1.1 (Index 5a)	Normal operation	<p>Unisig subset — 026-V222 — ERTMS/ETCS functional statements — 03 2002</p> <p>Unisig subset — 043-V200 — FFFS for Euroloop subsystem — 06 2002</p> <p>Unisig subset — 046-V200 — Radio infill FFFS — 06 2002</p> <p>Unisig subset — 047-V200 — Trackside-trainborne FIS for radio infill 06 2002</p> <p>Unisig subset — 054-V200 — Assignment of values to ETCS variables — 06 2002</p> <p>Unisig subset — 055-V222 — Clarification and amendment specification — 06 2002</p>
4.1.1 (Index 5b)	Degraded operation	Unisig subset — 026-V222
4.1.1 4.1.2.2 (Index 6)	STM management	<p>Unisig subset — 035-V200 — 03 2002</p> <p>Unisig subset — 026-V222</p> <p>Unisig subset — 056-V200 — STM FFFIS safe timer layer — 06 2002</p> <p>Unisig subset — 057-V200 — STM FFFIS safe link layer — 06 2002</p>
4.1.1 (Index 7)	MMI driver interface functional requirements	<p>Unisig subset — 033-V200 — FIS for the man-machine interface — 03 2002</p> <p>Unisig subset — 026-V222</p> <p>Unisig subset — 035-V200 — Specific transmission module FFFIS — 03 2002</p>
4.1.1 (Index 8)	Odometry requirements	Unisig subset — 041-V200 — Performance requirements for interoperability — 06 2002
4.1.1 (Index 9)	Requirements for the onboard recording of operational data	<p>Unisig subset — 026-V222</p> <p>Unisig subset — 027-V200 — FFFIS juridical recorder downloading tool — 03 2002</p>
4.1.1 (Index 10)	Vigilance (deadman's) system requirements	Derived from UIC leaflet 641 — Conditions to be fulfilled by automatic vigilance devices used in international traffic; 4th edition, February 2001
4.1.1 4.2.1.2e (Index 11)	Radio	Eirene SRS Version 13 — 06 2002

### 5.5.1.3. Interfaces between onboard and trackside assemblies

<b>TSI sections</b>	<b>Characteristics</b>	<b>Mandatory standards and other documents</b>
3.2.5.1.2 4.1.2.1 (Index 12a)	Balise (interface: train–ground)	ETSI EN300 330-1: 2000 — Frequency used  (up to and including sub-clause 7.2, the applicable up-link and tele-powering frequency ranges are defined in Unisig subset-036-V200)  Unisig subset — 036-V200 — 06 2002  Eurosig/WP3.1.2.3 ABB007  Eurosig/WP3.1.2.3 ABB020  Eurosig/WP3.1.2.3 ABB009  Eurosig/WP3.1.2.3 GA0347
3.2.5.1.2 4.1.2.1 (Index 12b)	Loop (interface: train–ground)	Unisig subset — 043-V200 — FFFS for Euroloop subsystem — 06 2002  Unisig subset — 044-V200 — FFFIS ‘A <sub>L</sub> ’ Euroloop subsystem — 06 2002  Unisig subset — 045-V200 — FFFIS ‘C <sub>L</sub> ’ Euroloop subsystem — 06 2002
3.2.5.1.2 4.1.2.1 (Index 12c)	Radio (interface: train–ground)	CEPT TR25-09
4.1.2.2 (Index 13a)	Radio (onboard data communications interfaces)	Unisig subset — 026-V222 — ERTMS/ETCS functional statements — 03 2002  Unisig subset — 034-V200 — FIS for the train interface — 03 2002  Unisig subset — 047-V200 — Trackside–trainborne FIS for radio infill — 06 2002  Unisig subset — 037-V200 — Euroradio FIS — 06 2002  Unisig subset — 093-V200  Morane A11T6001-3 (July 1998)  Unisig subset — 048-V200 — Trainborne FFFIS for radio infill — 06 2002  Unisig subset — 049-V200 — Radio infill FIS with LEU/interlocking — 06 2002
4.1.2.2 (Index 13b)	Train data interface for analysis of operational data recorded onboard	Unisig subset — 027 -V200 — FFFIS juridical recorder downloading tool — 03 2002
4.1.2.2 (Index 13c)	Odometry interfaces	Specification to be developed on the basis of ERTMS/97/e267

<b>TSI sections</b>	<b>Characteristics</b>	<b>Mandatory standards and other documents</b>
4.1.2.3 (Index 14a)	ERTMS/GSMR and ERTMS/ETCS (trackside data communication interfaces)	Unisig subset — 026-V222 — 03 2002  Unisig subset — 037-V200  Unisig subset — 093-V200  Morane A11T6001-3 (July 1998)  Unisig subset — 049-V200
4.1.2.3 (Index 14b)	Eurobalise and LEU (trackside data communication interfaces)	Unisig subset — 036-V200 — FFFIS for Eurobalise — 06 2002
4.1.2.3 (Index 14c)	Euroloop and LEU (trackside data communication interfaces)	Unisig subset — 045-V200 — FFFIS 'C <sub>L</sub> ' Euroloop subsystem — 06 2002
4.1.2.3 (Index 14d)	ERTMS/ETCS and ETCS (RBC-RBC-handover) (trackside data communication interfaces)	Unisig subset — 039-V200 — FIS for RBC/RBC handover — 06 2002
4.1.2.4 (Index 15)	Key management (trackside data communication interfaces)	Unisig subset — 038-V200 — Key management FIS — 06 2002

#### 5.5.1.4. Compatibility (not EMC) between trains and track circuits

<b>TSI sections</b>	<b>Characteristics</b>	<b>Mandatory standards and other documents</b>
4.2.1.2B (Index 16)	Rolling stock characteristics necessary to be compatible with train-detection system	See Annex A to the control-command and signalling TSI

#### 5.5.1.5. Data interfaces between control-command and rolling-stock

<b>TSI sections</b>	<b>Characteristics</b>	<b>Mandatory standards and other documents</b>
4.2.1.2E (Index 17)	Train interfaces	Unisig subset — 034-V200 — FIS for the train interface — 03 2002

#### 5.5.1.6. Performance

<b>TSI sections</b>	<b>Characteristics</b>	<b>Mandatory standards and other documents</b>
4.1.1 4.3 (Index 18)	Performance required	Unisig subset — 041-V200 — Performance requirements for interoperability — 06 2002

### 5.5.1.7. Verification requirements

<b>TSI sections</b>	<b>Characteristics</b>	<b>Mandatory standards and other documents</b>
6.2 (Index 32)	Onboard assembly integration requirements	To be defined
6.2 (Index 33)	Trackside assembly integration requirements	To be defined
Tables 6.1 and 6.2 (Index 34)	Installation requirements	Unisig subset — 040-V200 — Dimensioning and engineering rules — 06 2002
(Index 35)	Glossary of terms and abbreviations	Unisig subset — 023-V200 — Glossary of terms and abbreviations — 03 2002

### 5.5.2. Standards or other documents not referred to in the control-command and signalling TSI (and therefore voluntary)

#### 5.5.2.1. Interoperability constituents

##### SAFETY

<b>TSI sections</b>	<b>Characteristics</b>	<b>Relevant standards or other documents</b>
3.2.1 3.2.2a (Index 2b)	Reliability, availability, maintainability and safety	ERTMS/96S 1266  EEIG 02S1266-Version 6  EN50128:2001 — Railway applications — Communication, signalling and processing systems — Software for railway control and protection systems (NB: EN50128 refers also to standards EN50159-1 and EN50159-2.)

#### 5.5.2.2. Environmental protection (EMC)

<b>TSI sections</b>	<b>Characteristics</b>	<b>Relevant standards and other documents</b>
3.2.5.1.1 4.2.1.2d (Index 3)	Environmental physical conditions	EN50125-3:2003 — Railway applications — Environmental conditions for equipment — Part 3: Equipment for signalling and communications

### 5.5.2.3. Control-command functions

<b>TSI sections</b>	<b>Characteristics</b>	<b>Relevant standards and other documents</b>
4.1.1 (Index 5a)	Normal operation	<p>Unisig subset — 050-V200 — Description for the Euroloop system</p> <p>Unisig subset — 030-V200 — ERTMS/ETCS SSRS Part 1: system macro functions overview — 03 2002</p> <p>Unisig subset — 031-V200 — ERTMS/ETCS SSRS Part 2: Onboard-subsystem requirements specification — 03 2002</p> <p>Unisig subset — 032-V200 — ERTMS/ETCS SSRS Part 3: trackside subsystem requirements specification — 03 2002</p>
4.1.1 (Index 5b)	Degraded operation	
4.1.1 4.1.2.2 (Index 6)	STM management	<p>Unisig subset — 058-V200 — FFFIS STM application layer supervision connection — 06 2002</p> <p>Unisig subset — 059-V200 — Performance requirements for STMs — 06 2002</p>
4.1.1 (Index 7)	MMI driver interface functional requirements	prENxxxxx (April 2000) — Railway applications — ERTMS — Functional aspects of driver-machine interface (current draft of CLC TC 9X SC A WG 9-D, dated April 2000)
4.1.1 (Index 8)	Odometry requirements	
4.1.1 (Index 9)	Requirements for the onboard recording of operational data	
4.1.1 (Index 10)	Vigilance (deadman's) system requirements	
4.1.1 4.2.1.2e (Index 11)	Radio	EN301515:2002 — Global system for mobile communication (GSM): Requirements for GSM operation on railways

#### 5.5.2.4 Interfaces between onboard and trackside assemblies

<b>TSI sections</b>	<b>Characteristics</b>	<b>Relevant standards and other documents</b>
3.2.5.1.2 4.1.2.1 (Index 12a)	Balise (interface: train–ground)	EN301515:2002
3.2.5.1.2 4.1.2.1 (Index 12b)	Loop (interface: train–ground)	Unisig subset — 050-V200 — Description of Euroloop subsystem — 03 2002
3.2.5.1.2 4.1.2.1 (Index 12c)	Radio (interface: train–ground)	ETSI GSM TS Phase 2 (in development)  EN301515:2002
4.1.2.2 (Index 13a)	Radio (onboard data communications interfaces)	Unisig subset — 037-022a — Transmission of the MSISDN number to the application — 06 2002 and 023a: Version upgrade — 03 2002  EN301515:2002
4.1.2.2 (Index 13b)	Train data interface for analysis of operational data recorded onboard	
4.1.2.2 (Index 13c)	Odometry interfaces	
4.1.2.3 (Index 14a)	ERTMS/GSMR and ERTMS/ETCS (Trackside data communication interfaces)	EN301515:2002
4.1.2.3 (Index 14b)	Eurobalise and LEU (trackside data communication interfaces)	EN301515:2002
4.1.2.3 (Index 14c)	Euroloop and LEU (trackside data communication interfaces)	
4.1.2.3 (Index 14d)	ERTMS/ETCS and ETCS (RBC-RBC-handover) (trackside data communication interfaces)	
4.1.2.4 (Index 15)	Key management (trackside data communication interfaces)	Unisig subset — 051-V200 — FIS key management second phase — 06 2002  Unisig subset — 060-V111 — Key management migration — 06 2002

#### 5.5.2.5. Compatibility (not EMC) between trains and track circuits

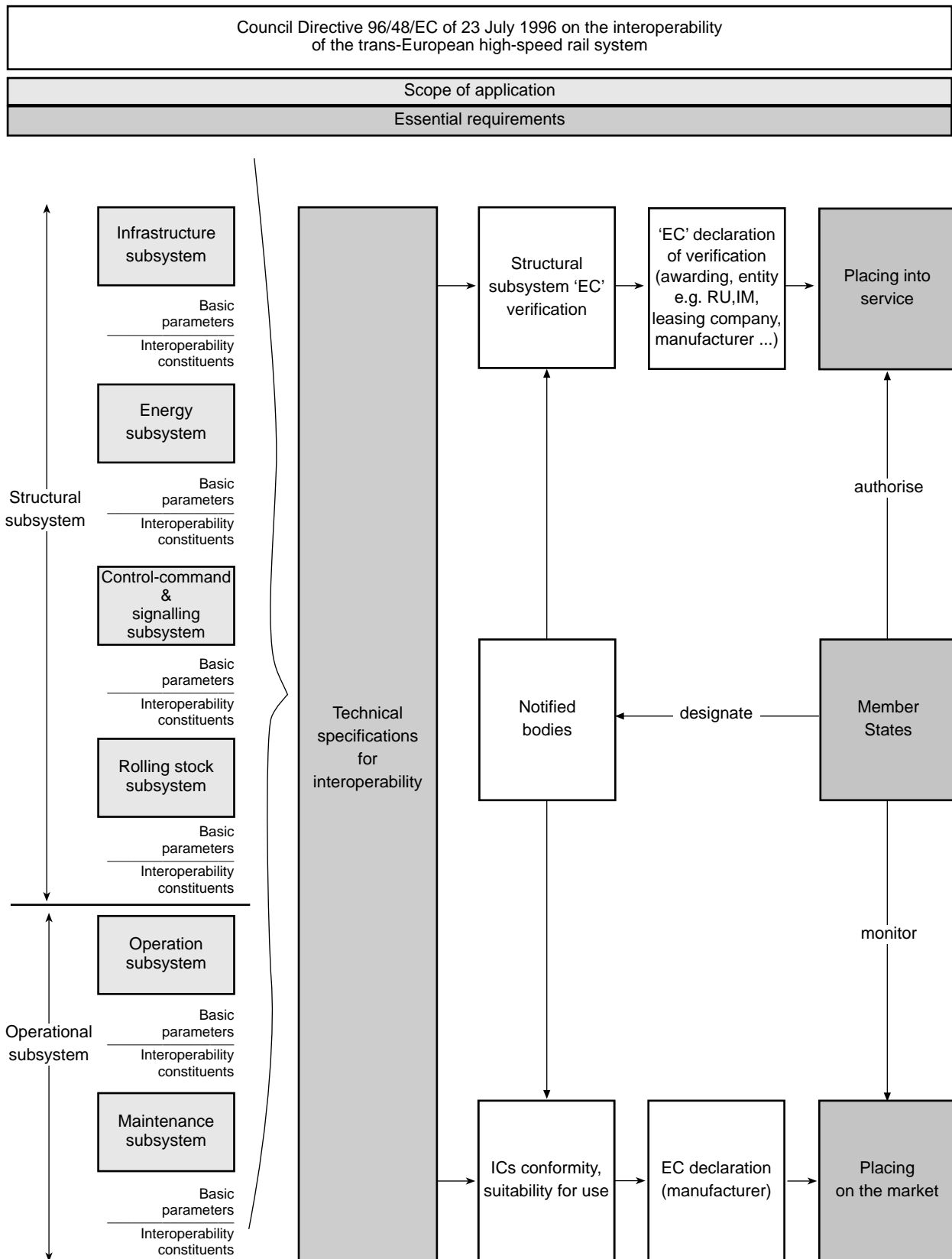
<b>TSI sections</b>	<b>Characteristics</b>	<b>Relevant standards and other documents</b>
4.2.1.2B (Index 16)	Rolling stock characteristics necessary to be compatible with train-detection system	New standard in CLC TC 9X WG... dealing with the interference between traction currents and signalling

## ANNEX 1: REFERENCES OF NATIONAL TRANSPOSITIONS OF DIRECTIVE 96/48/EC

Member State	Reference
<b>BE</b>	<p>Arrêté royal relatif à l'interopérabilité du système ferroviaire transeuropéen à grande vitesse. C — 2000 — 14115.</p> <p>Directive 96/48/EC was transposed into national law on 3 April 2000. The text was published in the <i>Moniteur belge</i>, 2nd edition, dated 24 May 2000, p. 17379.</p>
<b>DK</b>	<p>Bekendtgørelse om interoperabilitet i det transeuropæiske jernbanesystem for højhastighedstog nr. 181, 25.3.1999 — Announcement about the interoperability in the trans-European rail system for high-speed trains No 181, dated 25 March 1999.</p> <p>Directive 96/48/EC was transposed into national law on 4 April 1999.</p>
<b>DE</b>	<p>Verordnung über die Interoperabilität des transeuropäischen Hochgeschwindigkeitsbahnsystems (Eisenbahn-Interoperabilitätsverordnung — EIV), published in the <i>Bundesgesetzblatt</i>, Part 1 (BGBl I).</p> <p>Directive 96/48/EC was transposed into national law on 1 April 1999. The text was published in BGBl, Part I, dated 4 June 1999.</p>
<b>EL</b>	<p>Presidential Decree No 345 in 2001 concerning the harmonisation of Greek law with Council Directive 96/48/EC of 23 July 1996 regarding the interoperability of the trans-European high-speed rail system.</p> <p>Directive 96/48/EC was transposed into national law on 8 October 2001. The text of the Presidential Decree was published in the Official Journal, issue A, No 232, p. 3319 dated 11 October 2001.</p>
<b>ES</b>	<p>Real Decreto 1191/2000 of 23.6.2000, sobre interoperabilidad del sistema ferroviario de alta velocidad.</p> <p>The text was published in the <i>BOE</i> dated 5 July 2000.</p>
<b>FR</b>	<p>Décret n° 2001-129 du 8.2.2001 portant transposition de la directive 96/48/CE du Conseil du 23.7.1996 relative à l'interopérabilité du système ferroviaire transeuropéen à grande vitesse.</p> <p>Directive 96/48/EC was transposed into national law on 8 February 2001. The text was published in the <i>Journal Officiel</i> No 35, dated 10 February 2001, p. 2277.</p>
<b>IE</b>	<p>European Communities (interoperability of the trans-European high-speed rail system) regulations 2002.</p> <p>These regulations, dated 28 March 2002, transpose Directive 96/48/EC into Irish law.</p>
<b>IT</b>	<p>Decreto legislativo 24.5.2001, n. 299. Attuazione della direttiva 96/48/CE relativa all'interoperabilità del sistema ferroviario transeuropeo ad alta velocità.</p> <p>Directive 96/48/EC was transposed into national law on 24 May 2001. The text was published in the <i>Gazzetta Ufficiale della Repubblica Italiana</i> dated 21 July 2001.</p>
<b>LU</b>	<p>Règlement grand-ducal du 24.4.2000 portant transposition de la directive 96/48/CE du Conseil du 23.7.1996 relative à l'interopérabilité du système ferroviaire transeuropéen à grande vitesse.</p> <p>Directive 96/48/EC was transposed into national law on 24 April 2000. The text was published in <i>Memorial — Journal Officiel du Grand-Duché de Luxembourg (Recueil de Législation)</i>, A No 38, dated 18 May 2000, p. 916.</p>

Member State	Reference
NL	<p>The transposition into national law was done by the following two documents:</p> <ol style="list-style-type: none"> <li>1. Decree 562 of 15 December 1999, containing the regulations of transposition of Directive 96/48/EC of 23 July 1996 (OJ L 235) (Decree on the interoperability of the trans-European high-speed rail system);</li> <li>2. The <i>Spoorweg Wet</i>. The references to the corresponding articles in the <i>Spoorweg Wet</i> are listed at the relevant places of Besluit 562.</li> </ol> <p>Directive 96/48/EC was transposed into national law on 23 December 1999. The text was published in the <i>Staatsblad van het Koninkrijk der Nederlanden</i>, dated 23 December 1999.</p>
AT	<p>Bundesgesetz, mit dem das Eisenbahngesetz 1957 geändert wird: Abschnitt IVb, ‘Interoperabilität des Hochgeschwindigkeitsbahnsystems’ (National legislation for changing the Eisenbahngesetz 1957: Section IVb, ‘Interoperability of the high-speed rail system’).</p> <p>Directive 96/48/EC was transposed into national law on 1 June 2002. The text was published in the <i>Bundesgesetzblatt</i> (official Austrian law gazette) dated 26 April 2002.</p>
PT	<p>Decreto-Lei n.º 93/2000, <i>Diário da República</i> — I Série A, n.º 119, 23 May 2000.</p>
FI	<p>Laki Euroopan laajuisen rautatiejärjestelmän yhteentoimivuudesta / Lag om driftskompatibiliteten hos det transeuropeiska järnvägsystemet (Act on the interoperability of the trans-European rail system signed in Naantali on 28 June 2002 by the President of the Finnish Republic).</p> <p>The Act entered into force on 1 September 2002.</p>
SE	<p>A. Lag SFS 2000:1336 om järnvägssystem för höghastighetståg; published in <i>Svensk författningssamling</i> on 22 December 2000 (Law on the high-speed rail system).</p> <p>B. Lag SFS 2000:1337 om ändring i järnvägssäkerhetslagen (1990:1157); published in <i>Svensk författningssamling</i> on 22 December 2000 (Law on the change in the law on railway safety).</p> <p>C. Lag SFS 2000:1338 om ändring i lagen (1995:1649) om byggande av järnväg; published in <i>Svensk författningssamling</i> on 22 December 2000 (Law on the change in the law on railway construction).</p> <p>D. Förordning SFS 2000:1339 om järnvägssystem för högastighetståg; published in <i>Svensk författningssamling</i> on 22 December 2000 (Ordinance on the high-speed rail system).</p> <p>E. Förordning SFS 2000:1340 om ändring i förordningen (1998:1392) med instruktion för Banverket; published in <i>Svensk författningssamling</i> on 22 December 2000 (Ordinance on the change of ordinance 1998:1392 with instructions for Banverket).</p> <p>F. JH 9.1 Järnvägsinspektionens föreskrifter om driftskompatibilitet för svensk anslutning till det transeuropeiska järnvägssystemet för höghastighetståg (BV-FS 2001:2) (Rule of the railway inspectorate on the interoperability of the Swedish connection to the trans-European high-speed rail system).</p> <p>Directive 96/48/EC was transposed into national law on 14 December 2000. The text was published in <i>Svensk författningssamling</i> dated 22 December 2000.</p>
UK	<p>The Railways (Interoperability) (High-Speed) Regulations 2002 implementing Directive 96/48/EC on the interoperability of the trans-European high-speed rail system in the United Kingdom, came into force on 16 May 2002.</p>

## ANNEX 2: GENERAL ARCHITECTURE OF DIRECTIVE 96/48/EC AND THE HIGH-SPEED TSIs



## ANNEX 3: USEFUL INTERNET LINKS AND ADDRESSES

### 3.1. List of the sales agents of the *Official Journal of the European Union*

[http://publications.eu.int/general/en/salesagents\\_en.htm](http://publications.eu.int/general/en/salesagents_en.htm)

### 3.2. European legislation and documents on rail interoperability

[http://europa.eu.int/comm/transport/rail/interoperability/tsi\\_en.htm](http://europa.eu.int/comm/transport/rail/interoperability/tsi_en.htm)

### 3.3. List of harmonised standards relevant to Directive 96/48/EC

<http://europa.eu.int/comm/enterprise/newapproach/standardization/harmstds/reflist/hisprail.html>

The information contained in the summary list is a compilation of the references of standards that have been published in the *Official Journal of the European Communities*.

Although this list is updated regularly, it may not be complete and it does not have any legal validity; only publication in the Official Journal produces legal effect.

Additional information can be found at the European Standardisation Organisations' websites:

- CEN: <http://www.cenorm.be>
- Cenelec: <http://www.cenelec.be>
- ETSI: <http://www.etsi.org>

### 3.4. List of the bodies notified to the Commission under Directive 96/48/EC

<http://europa.eu.int/comm/enterprise/newapproach/legislation/nb/en96-48-ec.pdf>

This list of notified bodies is given for information only and is valid at the date indicated on the Internet site.

Information is made available on the basis of the documentation provided by the designating authorities of the Member States.

### 3.5. Format for the infrastructure and rolling stock registers

[http://europa.eu.int/comm/transport/rail/interoperability/tsi\\_en.htm](http://europa.eu.int/comm/transport/rail/interoperability/tsi_en.htm)

### 3.6. Indicative list of references to national rules complementing the high-speed TSIs

[http://europa.eu.int/comm/transport/rail/interoperability/tsi\\_en.htm](http://europa.eu.int/comm/transport/rail/interoperability/tsi_en.htm)

### 3.7. AEIF: European Association for Railway Interoperability

AEIF Administration: 221 avenue Louise, B-1050 Brussels  
tel. (32-2) 626 12 65, fax (32-2) 626 12 61

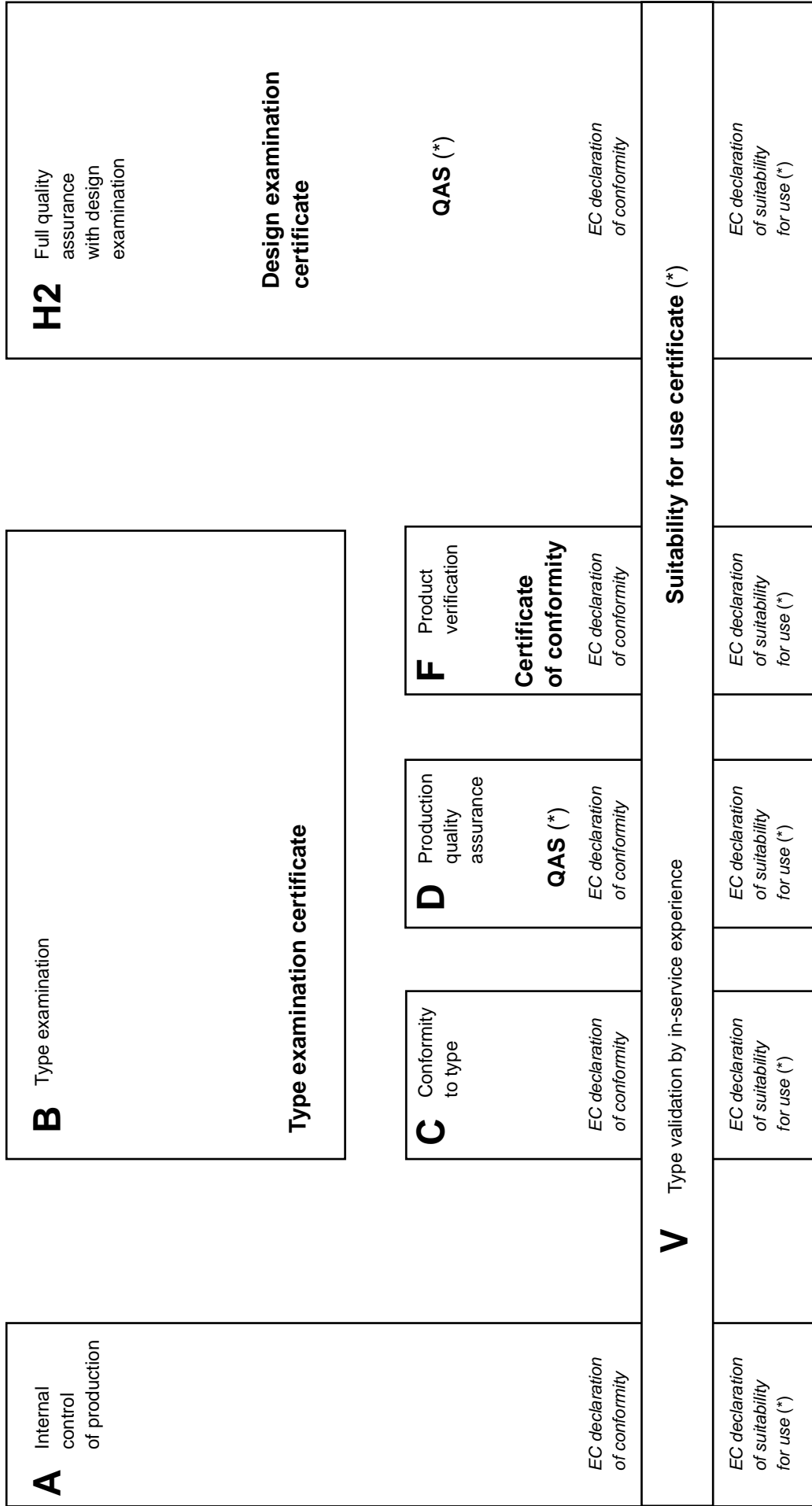
AEIF Technical Offices: 66 boulevard de l'Impératrice, B-1000 Brussels  
tel. (32-2) 525 96 38, fax (32-2) 525 96 39

Internet site: <http://www.aeif.org>

## ANNEX 4: REVISION REQUEST APPLICATION FORM (EXAMPLE)

<b>DIRECTIVE 96/48/EC</b>	<b>TECHNICAL SPECIFICATION FOR INTEROPERABILITY REVISION REQUEST APPLICATION FORM</b>
<b>AUTHOR OF THE REQUEST</b>	
Name: _____ Function: _____	
Company: _____	
Address: _____ _____	
Tel. _____ Fax _____ E-mail: _____	
REQUEST REFERENCE NUMBER OF THE AUTHOR: _____	
SUBJECT (with relevant directive clause/TSI provision where applicable): _____ _____	
DESCRIPTION OF THE PROBLEM: _____ _____ _____ _____ _____	
Attached files: <input type="checkbox"/> _____	
PROPOSED SOLUTION(S): _____ _____ _____ _____ _____	
Attached files: <input type="checkbox"/> _____	
SENT TO AEIF (¹):	Date:
Signature:	
<small>(¹) AEIF: 66 boulevard de l'Impératrice, B-1000 Brussels</small>	
<b>PART RESERVED FOR THE AEIF:</b>	
AEIF's registration number:	Date:

## ANNEX 5: STRUCTURE OF THE MODULES FOR INTEROPERABILITY CONSTITUENTS ASSESSMENT



**Documents issued by notified bodies**

*Documents issued by manufacturers*

(\*) Quality system approval and surveillance

## ANNEX 6: MANUFACTURER'S AND NOTIFIED BODY'S TASKS FOR INTEROPERABILITY CONSTITUENTS ASSESSMENT

TSI	Applicable modules						
Rolling stock	A	B		D	F	H2	V
Infrastructure	A	B		D	F	H2	V
Control-command		B		D	F	H2	
Energy		B	C			H2	
Operation	No interoperability constituents						
Maintenance (on-board installations)	A						
Maintenance (fixed installations)	A						

Module	Tasks of the manufacturer or its authorised representative	Tasks of the notified body
<b>A</b> <b>Internal control of production</b>	<p>All phases:</p> <ul style="list-style-type: none"> <li>takes all measures necessary to ensure that the design and the manufacturing process assures compliance of the interoperability constituent (IC) with the requirements specified in the TSI;</li> <li>draws up the 'EC' declaration of conformity</li> </ul>	<p>All phases:</p> <ul style="list-style-type: none"> <li>no tasks.</li> </ul>
<b>B</b> <b>Type examination</b>	<p>Design:</p> <ul style="list-style-type: none"> <li>establishes technical documentation which, as far as relevant for assessment, covers the design, manufacture and operation of the product;</li> <li>places at the disposal of the NB one (or more) specimens representative of the production envisaged (if type test is requested in the TSI);</li> <li>applies for the type examination by an NB.</li> </ul>	<p>Design:</p> <ul style="list-style-type: none"> <li>performs a design review (if requested in the TSI): examination of the design methods, the design tools and the design results;</li> <li>performs a review of the manufacturing process (if requested in the TSI);</li> <li>carries out tests or has them carried out (if type test is requested in the TSI);</li> <li>issues a type-examination certificate <sup>(1)</sup>.</li> </ul>
<b>C</b> <b>Conformity to type</b> (only together with B)	<p>Production:</p> <ul style="list-style-type: none"> <li>takes all measures necessary to ensure that manufacturing assures compliance of the IC with the approved type;</li> <li>draws up the 'EC' declaration of conformity (with the approved type).</li> </ul>	<p>Production:</p> <ul style="list-style-type: none"> <li>no tasks.</li> </ul>
<b>D</b> <b>Production quality assurance</b> (only together with B)	<p>Production:</p> <ul style="list-style-type: none"> <li>operates a quality system for production and testing, approved and surveyed by an NB;</li> <li>draws up the 'EC' declaration of conformity (with the approved type).</li> </ul>	<p>Production:</p> <ul style="list-style-type: none"> <li>approves the quality system;</li> <li>carries out surveillance of the quality system;</li> <li>issues visit report or audit report.</li> </ul>
<b>F</b> <b>Product verification</b> (only together with B)	<p>Production:</p> <ul style="list-style-type: none"> <li>applies for verification of conformity of products by an NB;</li> <li>draws up the 'EC' declaration of conformity (with requirements of TSI).</li> </ul>	<p>Production:</p> <ul style="list-style-type: none"> <li>verifies conformity of products;</li> <li>issues a certificate <sup>(1)</sup> of conformity.</li> </ul>

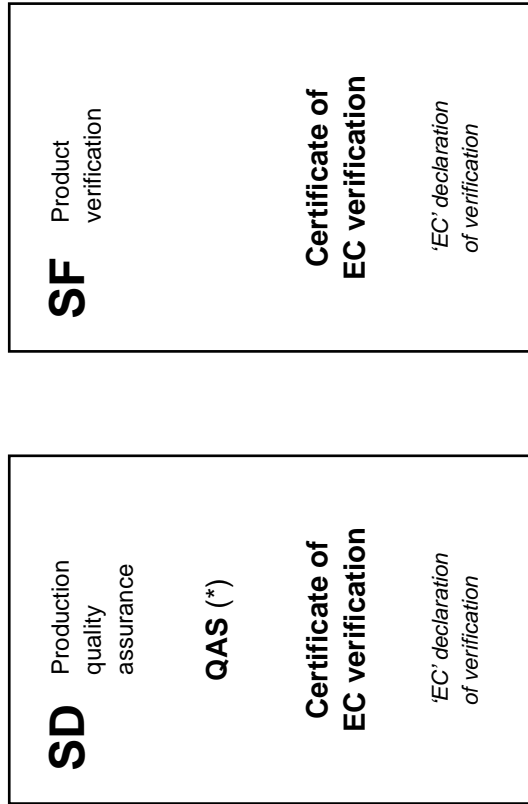
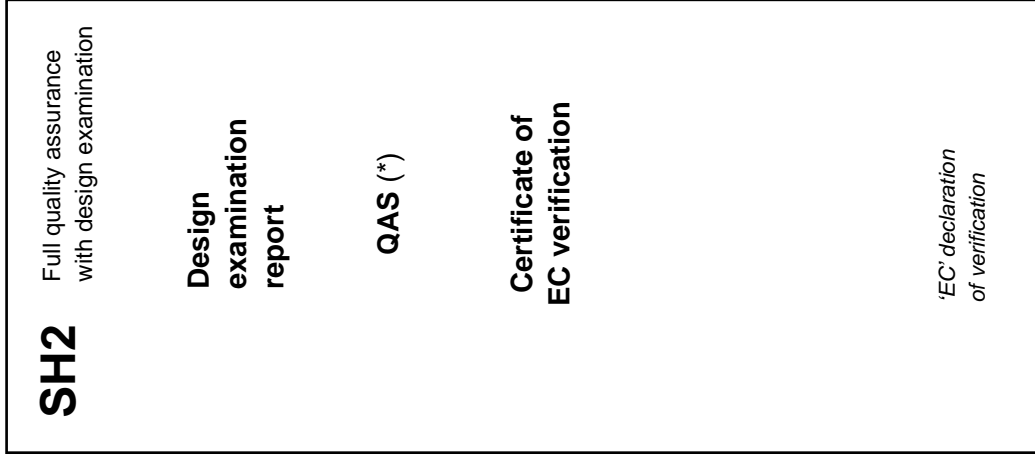
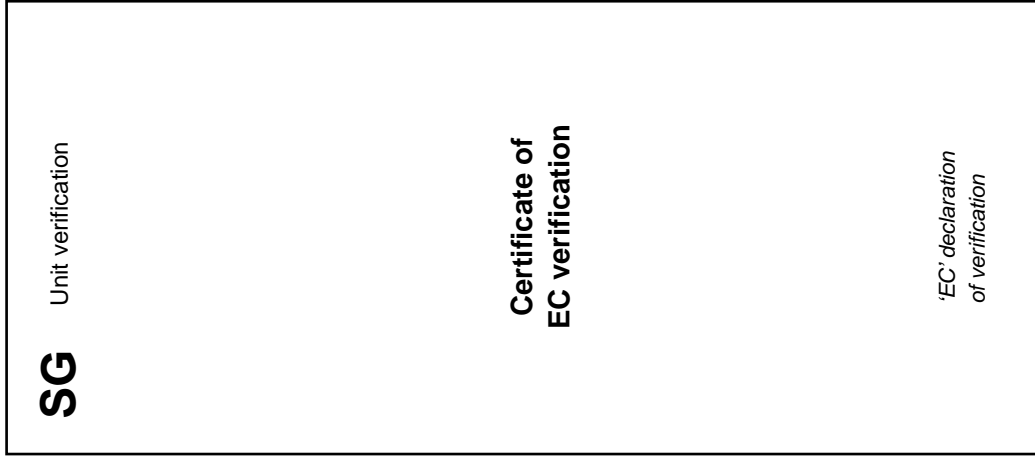
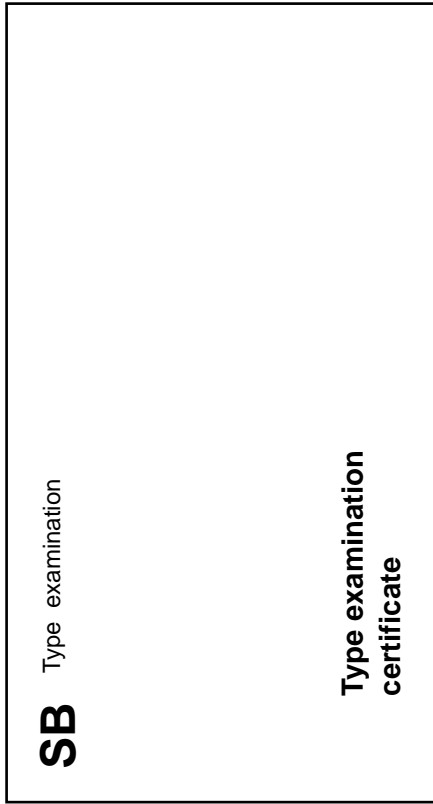
<sup>(1)</sup> See Annex 11 for the necessary elements to be mentioned on the NBs' certificates.

**INTEROPERABILITY CONSTITUENTS ASSESSMENT (continued)**

Module	Tasks of the manufacturer or its authorised representative	Tasks of the notified body
<p><b>H2</b> <b>Full quality assurance with design examination</b></p>	<p>Design:</p> <ul style="list-style-type: none"> <li>• operates an approved quality system for design;</li> <li>• carries out type tests (if requested by TSI) in an appropriate laboratory;</li> <li>• gives evidence to the NB that the IC meets all requirements of the TSI, including the results of tests (if requested);</li> <li>• applies for a design examination by an NB.</li> </ul> <p>Production:</p> <ul style="list-style-type: none"> <li>• operates a quality system for production and testing, approved and surveyed by an NB;</li> <li>• draws up the 'EC' declaration of conformity.</li> </ul>	<p>Design:</p> <ul style="list-style-type: none"> <li>• assesses and approves the quality system;</li> <li>• carries out surveillance of the quality system;</li> <li>• performs a design examination: examination of the application including: <ul style="list-style-type: none"> <li>— technical design specifications applied,</li> <li>— supporting evidence of design adequacy with provisions of TSI,</li> <li>— results of type tests performed in an appropriate laboratory;</li> </ul> </li> <li>• issues a design examination certificate <sup>(1)</sup>.</li> </ul> <p>Production:</p> <ul style="list-style-type: none"> <li>• approves the quality system;</li> <li>• carries out surveillance of the quality system.</li> </ul>
<p><b>V</b> <b>Suitability for use</b>  (type validation by in-service experience)</p>	<p>In-service experience:</p> <ul style="list-style-type: none"> <li>• applies for type validation by in-service experience by an NB;</li> <li>• places in service one (or more) specimens representative of the production envisaged;</li> <li>• monitors the in-service behaviour of the IC by a procedure, approved and surveyed by an NB;</li> <li>• gives evidence to the NB, that the IC meets all requirements of the TSI, including the results of in-service experience;</li> <li>• draws up the 'EC' declaration of suitability for use.</li> </ul>	<p>In-service experience:</p> <ul style="list-style-type: none"> <li>• verifies the technical documentation and the programme for validation by in-service experience;</li> <li>• approves the monitoring procedure of the in-service behaviour and carries out specific surveillance;</li> <li>• assesses if the in-service behaviour meets the requirements of the TSI;</li> <li>• issues a suitability for use certificate <sup>(1)</sup>.</li> </ul>

<sup>(1)</sup> See Annex 11 for the necessary elements to be mentioned on the NBs' certificates.

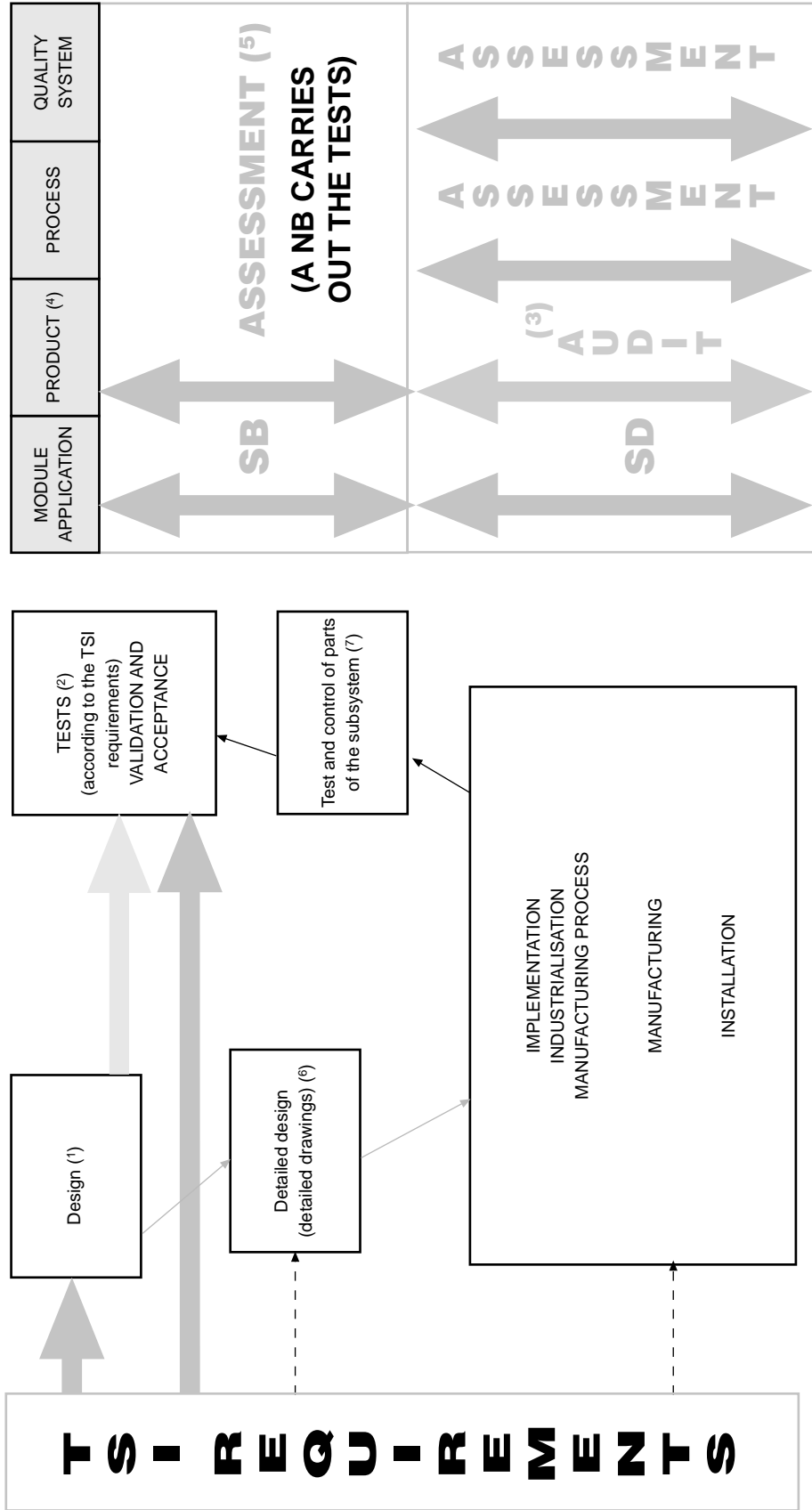
**ANNEX 7: STRUCTURE OF THE MODULES FOR SUBSYSTEMS' 'EC' VERIFICATION**



**Documents issued by notified bodies**  
*Documents issued by contracting entities*

(\*) Quality system approval and surveillance

## APPLICATION OF MODULES SB AND SD (TYPE EXAMINATION)



(1) Technical design specifications, supporting evidence of design adequacy with provisions of the TSI.

(2) Results of type tests requested in the TSI and performed in an appropriate laboratory or on the track.

(3) Surveillance of the application of the quality system on the product (quality system of the contracting entity and manufacturers involved).

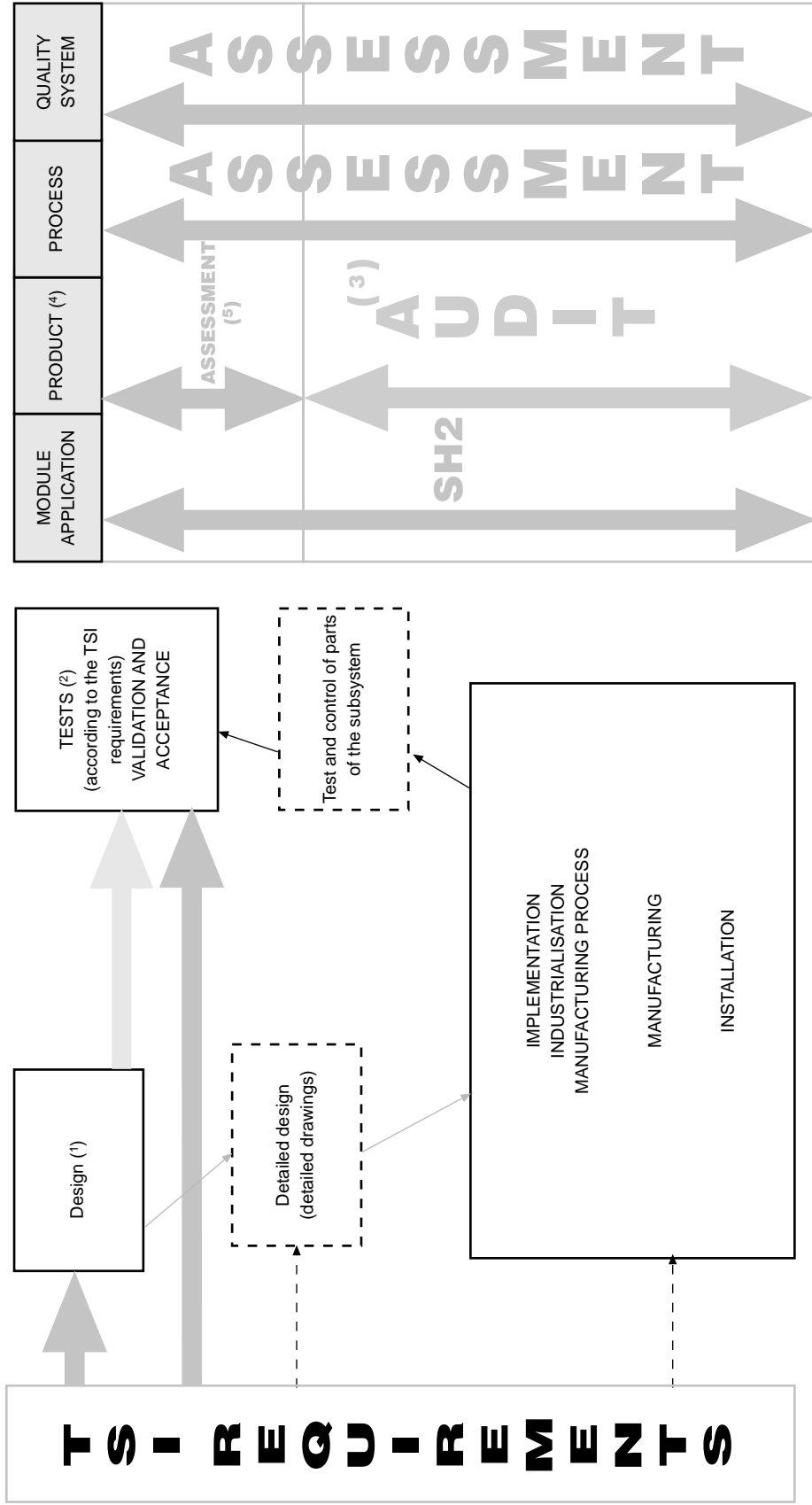
(4) In this case the product is the subsystem.

(5) For the tests requested by the TSI: The notified body carries out the tests and examines the test results.

(6) Design review performed by the notified body (examination of the design methods, design tools and design results).

(7) The notified body verifies that the subsystem parts (assemblies or sub-assemblies) have been manufactured in conformity with the technical documentation.

## APPLICATION OF MODULE SH2 (TYPE EXAMINATION)



- (1) Technical design specifications, supporting evidence of design adequacy with provisions of the TSI.
- (2) Results of type tests requested in the TSI and performed in an appropriate laboratory or on the track.
- (3) Surveillance of the application of the quality system on the product (quality system of the contracting entity and manufacturers involved).
- (4) In this case the product is the subsystem.
- (5) For the tests requested in the TSI: Examination of the test results and the methodology used to perform the tests.

## ANNEX 8: CONTRACTING ENTITY'S AND NOTIFIED BODY'S TASKS FOR SUBSYSTEMS' 'EC' VERIFICATION

TSI	Applicable modules
Rolling stock	SB/SD; SB/SF; SH2
Infrastructure	SG; SH2
Control-command	SB/SD; SB/SF; SG; SH2
Energy	SG; SH2
Operation	AE; DE (NB: The TSI defines and describes these two specific modules: AE applied by the railway undertaking and DE applied by the railway undertaking or the infrastructure manager. These two modules are not included in this annex.)
Maintenance (on-board installations)	SB/SD; SB/SF; SH2
Maintenance (fixed installations)	SG; SH2

Module	Tasks of the contracting entity or its authorised representative	Tasks of the notified body
<b>SB</b>  <b>Type examination</b>	<b>Design:</b> <ul style="list-style-type: none"> <li>• applies for ‘EC’ verification by type examination by an NB;</li> <li>• establishes a technical documentation as regards the design of the subsystem <sup>(1)</sup>;</li> <li>• establishes a technical documentation which, as far as relevant for assessment, covers design, manufacture, assembling, installation and operation of the subsystem <sup>(1)</sup> and which includes: <ul style="list-style-type: none"> <li>— a list of the ICs incorporated in the subsystem,</li> <li>— a list of manufacturers involved,</li> <li>— the subsystem register including indications as specified in the TSI;</li> </ul> </li> <li>• places at the disposal of the NB one (or more) specimens representative of the production and assembling envisaged for the subsystem (only, if type test is requested in the TSI) <sup>(1)</sup>.</li> </ul>	<b>Design:</b> <ul style="list-style-type: none"> <li>• examines the technical documentation;</li> <li>• checks the ‘EC’ declarations of all ICs incorporated in the subsystem;</li> <li>• performs a design review (if requested in the TSI): examination of the design methods, the design tools and the design results;</li> <li>• carries out tests or has them carried out (if type test is requested in the TSI);</li> <li>• compiles the technical file that has to accompany the ‘EC’ declaration of verification concerned;</li> <li>• issues a type-examination certificate <sup>(4)</sup> for ‘EC’ verification.</li> </ul>
<b>SD</b>  <b>Production quality assurance</b> (only together with SB)	<b>Production:</b> <ul style="list-style-type: none"> <li>• applies for ‘EC’ verification of the subsystem by an NB;</li> <li>• operates an approved quality system for production and testing, if involved <sup>(2)</sup>;</li> <li>• is contracting with manufacturer(s) <sup>(3)</sup>, operating a quality system for production and testing, approved and surveyed by an NB;</li> <li>• establishes a technical documentation as regards the manufacturing and assembling of the subsystem <sup>(1)</sup>, which includes, <i>inter alia</i>, the subsystem register including indications as specified in the TSI;</li> <li>• draws up the ‘EC’ declaration of verification (under reference to an ‘EC’ verification certificate <sup>(4)</sup> of an NB).</li> </ul>	<b>Production:</b> <ul style="list-style-type: none"> <li>• assesses and approves the quality system <sup>(4)</sup> of the contracting entity <sup>(2)</sup> and the manufacturer(s) involved <sup>(3)</sup>;</li> <li>• carries out surveillance of the quality system of the contracting entity and the manufacturer(s) involved <sup>(2)</sup> <sup>(3)</sup>;</li> <li>• compiles the complete technical file (technical record) for the subsystem and in particular the Register (Article 18(3) of Directive 96/48/EC);</li> <li>• issues a certificate <sup>(4)</sup> of ‘EC’ verification.</li> </ul>
<b>SF</b>  <b>Product verification</b> (only together with SB)	<b>Production:</b> <ul style="list-style-type: none"> <li>• applies for ‘EC’ verification of the subsystem by an NB;</li> <li>• establishes technical documentation as regards the manufacturing and assembling of the subsystem <sup>(1)</sup>, which includes, <i>inter alia</i>, the subsystem register including indications as specified in the TSI;</li> <li>• draws up the ‘EC’ declaration of verification (under reference to an ‘EC’ verification certificate <sup>(4)</sup> of an NB).</li> </ul>	<b>Production:</b> <ul style="list-style-type: none"> <li>• verifies conformity of the manufactured and assembled subsystem;</li> <li>• compiles the complete technical file (technical record) for the subsystem and in particular the Register (Article 18(3) of Directive 96/48/EC);</li> <li>• issues a certificate <sup>(4)</sup> of ‘EC’ verification.</li> </ul>

<sup>(1)</sup> Tasks will be carried out by the contracting entity on the basis of documentation and with the help of the manufacturer(s) contracted by the contracting entity.

<sup>(2)</sup> In case the contracting entity is directly involved in the design and/or production (including assembling and installation), it has to operate a quality system for those activities, approved and surveyed by an NB.

<sup>(3)</sup> The term ‘manufacturer’ also includes companies performing the assembling (assemblers) and installation of subsystems.

<sup>(4)</sup> See Annex 11 for the necessary elements to be mentioned on the NBs’ certificates.

## SUBSYSTEMS' 'EC' VERIFICATION (continued)

Module	Tasks of the contracting entity or its authorised representative	Tasks of the notified body
<b>SG</b>  <b>Unit verification</b>	Design and production: <ul style="list-style-type: none"> <li>• applies for 'EC' verification of the subsystem by an NB;</li> <li>• establishes a technical documentation of the subsystem <sup>(1)</sup>, which includes, <i>inter alia</i>, the subsystem register including indications as specified in the TSI;</li> <li>• draws up the 'EC' declaration of verification (under reference to an 'EC' verification certificate <sup>(4)</sup> of an NB).</li> </ul>	Design and production: <ul style="list-style-type: none"> <li>• carries out 'EC' verification procedure of the subsystem including all appropriate tests to ensure its conformity;</li> <li>• checks the 'EC' declarations of all ICs incorporated in the subsystem;</li> <li>• compiles the complete technical file (technical record) for the subsystem and in particular the Register (Article 18(3) of Directive 96/48/EC);</li> <li>• issues a certificate <sup>(4)</sup> of 'EC' verification.</li> </ul>
<b>SH2</b>  <b>Full quality assurance with design examination</b>	<ul style="list-style-type: none"> <li>• applies for 'EC' verification of the subsystem by an NB;</li> <li>• operates an approved quality system for design, production and testing, if involved <sup>(2)</sup>;</li> <li>• is contracting with manufacturer(s) <sup>(3)</sup>, which are operating a quality system for design, production and testing (as requested), approved and surveyed by an NB;</li> <li>• establishes technical documentation which, as far as relevant for assessment, covers design, manufacture, assembling, installation and operation of the subsystem <sup>(1)</sup> and which includes:               <ul style="list-style-type: none"> <li>— a list of the ICs incorporated in the subsystem,</li> <li>— a list of manufacturers involved,</li> <li>— the subsystem register including indications as specified in the TSI;</li> </ul> </li> <li>• carries out type tests (if requested by the TSI) in an appropriate laboratory <sup>(1)</sup>;</li> <li>• gives evidence to the NB, that the subsystem meets all requirements of the TSI, including the results of tests (if requested) <sup>(1)</sup>;</li> <li>• draws up the 'EC' declaration of verification (under reference to an 'EC' verification certificate <sup>(4)</sup> of an NB).</li> </ul>	<ul style="list-style-type: none"> <li>• assesses and approves the quality system of the contracting entity <sup>(2)</sup> and manufacturer(s) involved <sup>(3)</sup>;</li> <li>• carries out surveillance of the quality system of the contracting entity and manufacturer(s) involved <sup>(2)</sup> <sup>(3)</sup>;</li> <li>• examines the application, including:               <ul style="list-style-type: none"> <li>— technical design specifications applied,</li> <li>— supporting evidence of design adequacy with provisions of TSI,</li> <li>— results of type tests performed in an appropriate laboratory;</li> </ul> </li> <li>• checks the 'EC' declarations of all ICs incorporated in the subsystem;</li> <li>• issues a design examination report;</li> <li>• compiles the technical file (technical record) for the subsystem, and in particular the register (Article 18(3) of Directive 96/48/EC), as far as the design is concerned;</li> <li>• issues a certificate <sup>(4)</sup> of 'EC' verification.</li> </ul>

<sup>(1)</sup> Tasks will be carried out by the contracting entity on the basis of documentation and with the help of the manufacturer(s) contracted by the contracting entity.

<sup>(2)</sup> In a case where the contracting entity is directly involved in the design and or production (including assembling and installation), it has to operate a quality system for those activities, approved and surveyed by an NB.

<sup>(3)</sup> The term 'manufacturer' also includes companies performing the assembling (assemblers) and installation of subsystems.

<sup>(4)</sup> See Annex 11 for the necessary elements to be mentioned on the NBs' certificates.

## ANNEX 9: THE EUROPEAN STANDARDISATION CONTEXT

There are three European standardisation organisations (ESO) working in partnership:

- CEN (European Committee for Standardisation);
- Cenelec (European Committee for Electrotechnical Standardisation);
- ETSI (European Telecommunications Standards Institute).

CEN covers all the subjects outside the scope of Cenelec and ETSI.

The mission of the ESOs is to promote voluntary technical harmonisation in Europe, in conjunction with worldwide organisations.

With regard to the elements of the railway system, those are mainly treated:

- for CEN, under the Technical Committee TC 256 ‘Railway applications’. This rule is not absolute however, certain elements falling within the competence of general technical committees, such as for example the Technical Committee TC 250 ‘Structural Eurocodes’ for the structures or the Technical Committee TC 154 ‘Aggregates’ for ballast;
- for Cenelec, under the Technical Committee TC 9X;

and their respective sub-committees.

The ESOs’ process for developing standards respects the following principles.

- **Openness and transparency:** all interested parties can take part in the preparation of standards. This is usually achieved through the national standards bodies.
- **Consensus:** whenever possible, European standards are developed and adopted with the agreement of all the interested parties. When necessary, adoption of the final text is obtained by weighted majority voting.
- **National commitment:** national members are normally obliged to eliminate any previous national standard which may conflict with a European standard.
- **Technical coherence.**
- **Global coherence:** the ESOs takes into account the activities of the European sectorial bodies (such as aerospace, iron and steel, etc.) and the work of international standardisation bodies, especially the ISO.

The ESOs do not themselves publish the European standards. The ratified texts are sent to the national members, which publish them as national measures, keeping the EN catalogue entry (for example, BS EN71, DIN EN71, etc.).

In addition, national members may adopt international standards, for example, from ISO (or IEC). In this case, the national reference numbers also maintain the original ISO (or IEC) reference (for example, BS ISO 13296).

Also, CEN or Cenelec may adopt international standards from ISO (or IEC). In this case, the standards published by the national members have triple prefixes (for example, DIN EN ISO 9000).

## ANNEX 10: TERMINOLOGY RELATING TO CONFORMITY ASSESSMENT

Common definition for the most important terms used in the framework  
of the high-speed Directive 96/48/EC  
(this terminology was prepared by the AEIF Conformity Group)

Term	Definition (Reference)
Regulatory domain	Product requirements and all actions and activities to comply with, to verify and to attest these requirements, legally required by the State or by a State authority (-)
Voluntary domain	Product requirements and all actions and activities to comply with, to verify and to attest these requirements, which are required by the customer on a contractual base, but are <b>not</b> required by the State or by a State authority (-)
Multilateral acceptance	Recognition agreement that covers the acceptance of one party's assessment results by two or more parties (-)
Conformity	Fulfilment by a product of specified requirements (Modified from ISO/IEC Guide 2: 1996; 12.1, where processes and services are also included)
Suitability for use	Ability of a product to achieve and maintain a specified performance during its period of use (-)
Good behaviour in service	The fulfilment of the requirements set for the product while in service experience (-)
In-service experience	Validation of product requirements for suitability for use by operation or use of the product in service, integrated representatively into the railway system, over a specified operation time or running distance (-)
Validation under full operation conditions	Validation of a subsystem's conformity to special requirements after installation and placing into service under full operation conditions for a specified period of time (-)
In-service tests	Tests, undertaken in service under real operation conditions, to measure and/or to record specified characteristics of the product (-)
Assessment of conformity	Any activity concerned with determining directly or indirectly that relevant requirements are fulfilled (ISO/IEC Guide 2: 1996; 12.2)
Design examination (* (**)	Assessment of the design of a product by examination of the design methods, the design tools and the design results, taking into account, if appropriate, the results of tests and reviews and validation by in-service experience (**) Procedure within module H2 for interoperability constituents in STI, provided in Council Decision 93/465/EEC or SH2 for subsystems
Design review (* (**)	Documented, comprehensive and systematic examination of a design to evaluate its capability to fulfil the requirements for conformity at the completion of the design process (**) In a general sense, modified from EN ISO 8402: 1995 3.11
Design examination certificate	Document certifying the ability of the design of a product such that the product will meet the requirements (-)
Review of manufacturing process (*)	Documented, comprehensive and systematic examination of the manufacturing process devised for manufacturing a product, to evaluate its contribution to product conformity, carried out at the completion of the design process (-)

<b>Term</b>	<b>Definition (Reference)</b>
Type examination (*)	Assessment of a product type to its conformity and, where applicable, suitability for use by design review, review of the manufacturing process, type tests and in-service experience (if specified) (Procedure within module B or SB in STI, also provided in Council Decision 93/465/EEC)
Type examination certificate	Document certifying the conformity and suitability for use of a product type (-)
Sampling (*)	Selection of one or more specimens out of a whole lot (such as on a statistical base) to ensure, that the specimens represent the whole (-)
Type testing (*)	Conformity testing on the basis of one or more specimens of a product representative of the production (ISO/IEC Guide 2: 1996; 14.5)
Inspection (*)	Conformity evaluation by observation and judgement accompanied as appropriate by measurement, testing or gauging (ISO/IEC Guide 2: 1996; 14.2)
Evaluation (*)	Systematic examination of the extent to which a product fulfils specific requirements (Modified from ISO/IEC Guide 2: 1996; 14.1)
Evaluation report	A report on the results of a systematic examination of the extent to which a product fulfils specific requirements (-)
Verification (*)	Assessment of the product's conformity to specified technical requirements, performed step by step during the product development phase by specified tests or alternative methods (-)
Validation (*)	Confirmation by examination and provision of objective evidence, that the particular requirements for a specific intended use are fulfilled (ISO 8402: 1994; 2.18)
Surveillance of product conformity (*)	Constant or frequent monitoring and verification of product conformity, to ensure that specified requirements are being fulfilled (Modified from ISO 8402: 1994; 4.7, which concerns quality surveillance and is not restricted to products)
Assessment of conformity by professional judgement	Examination of a product, particularly the product design, on the basis of general (not specific) product requirements, by a professional expert (-)
Certification (*)	Procedure by which a third party gives written assurance that a product conforms to specified requirements (ISO/IEC Guide 2: 1996; 15.1.2)

(\*) Actions within the assessment of conformity procedure.

(-) No reference available to a standard or equivalent document; definition set up by the AEIF.

**ANNEX 11: ELEMENTS TO BE MENTIONED  
ON THE CERTIFICATES AND OTHER FORMAL DOCUMENTS  
ISSUED BY NOTIFIED BODIES**

Type of procedure:

- 1 — Assessment of the conformity of interoperability constituents
- 2 — Assessment of the suitability for use of interoperability constituents
- 3 — Verification of subsystems

	Necessary information to be included in the certificate/formal document's front page (Bilingual: official language of the applicant's Member State and English) (Language agreement of the Coordination Group NB-Rail)	Type of procedure																		
		1	2	3																
1	<p>Type and identification number of the certificate/formal document</p> <p>In accordance with the modules, NBs issue certificates but also other formal documents.</p> <p>In total, seven types of certificates/formal documents have been identified:</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Certificate/formal document type</th> <th style="text-align: left;">Module</th> </tr> </thead> <tbody> <tr> <td>• Type examination certificate</td> <td>B, SB</td> </tr> <tr> <td>• Design examination certificate</td> <td>H2</td> </tr> <tr> <td>• Design examination report</td> <td>SH2</td> </tr> <tr> <td>• Quality system approval</td> <td>D, SD, H2, SH2</td> </tr> <tr> <td>• Certificate of conformity</td> <td>F</td> </tr> <tr> <td>• Certificate of 'EC' verification</td> <td>SD, SF, SG, SH2</td> </tr> <tr> <td>• Suitability for use certificate</td> <td>V</td> </tr> </tbody> </table> <p>The NB attributes a unique identification number to each certificate/formal document. The coordination group NB-Rail has developed a numbering system for certificates and other formal documents. The reader should refer to NB-Rail for more details.</p>	Certificate/formal document type	Module	• Type examination certificate	B, SB	• Design examination certificate	H2	• Design examination report	SH2	• Quality system approval	D, SD, H2, SH2	• Certificate of conformity	F	• Certificate of 'EC' verification	SD, SF, SG, SH2	• Suitability for use certificate	V	X	X	X
Certificate/formal document type	Module																			
• Type examination certificate	B, SB																			
• Design examination certificate	H2																			
• Design examination report	SH2																			
• Quality system approval	D, SD, H2, SH2																			
• Certificate of conformity	F																			
• Certificate of 'EC' verification	SD, SF, SG, SH2																			
• Suitability for use certificate	V																			
2	European legal base and reference of Directive 96/48/EC transposition into the national law of the NB's Member State.	X	X	X																
3	Designation of the interoperability constituent/subsystem certified (type, product family, identification, version number, etc.)	X	X	X																
4	Name and address of the manufacturer (or of his authorised representative established within the Community) of the certified interoperability constituent. Place of manufacture	X	X																	
5	Name and address of: <ul style="list-style-type: none"> <li>• the contracting entity (or his authorised representative established within the Community);</li> <li>• the company(ies) responsible for: <ul style="list-style-type: none"> <li>— the design of the subsystem,</li> <li>— assembly of sub-assemblies and manufacture of the subsystem.</li> </ul> </li> </ul>			X X X																
6	Name and address of the NB; registration number at the European Commission.	X	X	X																
7	Statement about the assessment/verification results.  NB's statement declaring the conformity of the interoperability constituent/subsystem with the appropriate requirements or formally confirming the results of his investigations. This is the central statement in the certificate/formal document.	X	X	X																
8	Framework of the assessment/verification <ul style="list-style-type: none"> <li>— relevant directives;</li> <li>— TSIs;</li> <li>— modules;</li> </ul>	X X X	X X X	X X X																

	<b>Necessary information to be included in the certificate/formal document's front page</b> (Bilingual: official language of the applicant's Member State and English) (Language agreement of the Coordination Group NB-Rail)	<b>Type of procedure</b>		
		1	2	3
	<ul style="list-style-type: none"> <li>standards or other documents referred to in the TSIs (and therefore mandatory), where applicable;</li> <li>standards or other documents not referred to in the TSIs (and therefore voluntary), where applicable.</li> </ul>	X	X	X
9	Reference to annexes.  In most cases, the certificate/formal document will be the first part of a larger set of documents. This information aims to make all relevant documents (technical files, etc.) easily traceable.	X	X	X
10	Integration conditions of the certified constituent in railway system or subsystem (application field, conditions of use, functioning, etc.)	X	X	X
11	Expiry date.	X	X	
12	Place, date of issue and signature of the NB's authorised signatory.	X	X	X

	<b>Necessary information to be included in the certificate/formal document's annexes</b> (Official language of the applicant's Member State)	<b>Type of procedure</b>		
		1	2	3
13	Reference of the technical file (containing documentation as defined in the modules).	X	X	
14	List of optional requirements implemented in the IC/subsystem.	X	X	X
15	List of any restrictions to the approval (ICs' area of use, ...)	X	X	X
16	Name(s), place(s) and address(es) of manufacturer(s), when it is (they are) different than the name and address on the front page of the certificate/formal document.	X	X	X
17	When necessary:  list of approvals and other certifications issued for the subsystem/interoperability constituent(s) with the field of certification, the relevant standard(s), the name and address of the certification body, in case of: <ul style="list-style-type: none"> <li>quality management certificate (modules D, H2, SD, SH2),</li> <li>product certification against not mandatory standards for ICs, restricted to those directly pertaining to this certificate/formal document.</li> </ul>	X	X	X
18	When necessary, Name and address of inspection body(ies) and/or test centre(s), subcontractor(s) of the NB and action(s) subcontracted (in particular for assessment of suitability for use).	X	X	X
19	For 'EC' verification of subsystems: <ul style="list-style-type: none"> <li>indication of certificates of conformity or of suitability for use for all interoperability constituents, which are integrated in the subsystem;</li> <li>when necessary, list of other NBs involved in the 'EC' verification of the subsystem;</li> <li>when necessary, list of other European directives, which the ICs/subsystem comply with, together with the corresponding 'EC' declarations.</li> </ul>			X
20	For modules F, D, SF, SD, design/type examination, 'EC' certificates/reports with reference of the NB involved (if not on the certificate/formal document's front page).	X	X	X
21	Basis for assessment/verification (calculation results, test reports, inspection reports, design examination, etc.) including references to not attached documents and references to the evaluation report.	X	X	X

	Necessary information to be included in the certificate/formal document's annexes (Official language of the applicant's Member State)	Type of procedure		
		1	2	3
22	For assessment based on type tests: <ul style="list-style-type: none"> <li>• type delivery date to the testing body;</li> <li>• type manufacturing conditions (if special).</li> </ul>	X X	X X	X X
23	For assessment of suitability for use by in service experience: <ul style="list-style-type: none"> <li>• detail of the infrastructure manager(s) and/or railway undertaking(s) operating the interoperability constituent for in-service experience;</li> <li>• inspection report for monitoring the constituent behaviour and the conditions of use and maintenance.</li> </ul>		X X	

## ANNEX 12: LIST OF ABBREVIATIONS AND ACRONYMS

AC	alternating current
AEIF	European Association for Railway Interoperability (Association européenne pour l'interopérabilité ferroviaire)
CEN	European Committee for Standardisation
Cenelec	European Committee for Electrotechnical Standardisation
CEPT	European Conference of Postal and Telecommunications Administrations (Conférence européenne des administrations des postes et des télécommunications)
COST	(European Cooperation in the field of Scientific and Technical Research) (coopération européenne dans le domaine de la recherche scientifique et technique)
DC	direct current
EC	European Community
EEA	European Economic Area
EEC	European Economic Community
EEIG	European Economic Chamber of Trade, Commerce and Industry
Eirene	European integrated radio enhanced network
EMC	electromagnetic compatibility
EN	European standard
ERTMS	European Rail traffic management system
ERTMS/ETCS	ERTMS/European train control system
ERTMS/GSM-R	ERTMS/GSM-Rail
ESO	European Standardisation Organisation
ESROG	ERTMS Safety Requirements and Objectives Group
ETCS	European train control system
ETS	European telecommunications standard
ETSI	European Telecommunications Standards Institute
FFFIS	form fit functional interface specification
FFFS	form fit functional specification
FIS	functional interface specification
GSM	global system for mobile communications
HD	harmonisation document
HS	high speed
IC	interoperability constituent
IEC	International Electrotechnical Commission

IM	infrastructure manager
ISO	International Organisation for Standardisation
JPC	Joint Programming Committee of CEN/Cenelec/ETSI
JPCR	Joint Programming Committee Rail
JWG	Joint Working Group
MMI	man–machine interface
MS	Member State
NB	notified body
OJ	<i>Official Journal of the European Union</i>
QAS	quality assurance system
RAMS	reliability, availability, maintainability and safety
RFU	recommendation for use
RR	revision request
RRA	revision request author
RS	rolling stock
RU	railway undertaking
SC	Standard Committee
SS	subsystem
STM	specific transmission module
TC	technical committee
TR	technical report
TS	technical specifications
TSI	technical specifications for interoperability
UIC	International Union of Railways (Union internationale des chemins de fer)
UIP	International Union of Private Wagons Owners (Union internationale d'associations de propriétaires de wagons de particuliers)
UIRR	International Union of Combined Road–Rail Transport Companies (Union internationale des opérateurs de transport combiné rail-route)
UITP	International Association of Public Transport (Union internationale des transports publics)
UNIFE	Union of the European Railway Industries (Union des industries ferroviaires européennes)
Unisig	Steering committee involved in the development and implementation of ERTMS
WG	working group
WP	working party





European Commission

**The trans-European high-speed rail system — Guide for the application of the high-speed TSIs of Council Directive 96/48/EC**

Luxembourg: Office for Official Publications of the European Communities

2004 — 88 pp. — 21 × 29.7 cm

ISBN 92-894-6301-5



Venta • Salg • Verkauf • Πωλήσεις • Sales • Vente • Vendita • Verkoop • Venda • Myynti • Försäljning  
<http://eur-op.eu.int/general/en/s-ad.htm>

BELGIQUE/BELGIË

**Jean De Lannoy**  
Avenue du Roi 202/Koningslaan 202  
B-1190 Bruxelles/Brussel  
Tél. (32-2) 538 43 08  
Fax (32-2) 538 08 41  
E-mail: jean.de.lannoy@infoboard.be  
URL: <http://www.jean-de-lannoy.be>

**La librairie européenne/  
De Europese Boekhandel**  
Rue de la Loi 244/Wetstraat 244  
B-1040 Bruxelles/Brussel  
Tél. (32-2) 295 26 39  
Fax (32-2) 735 08 60  
E-mail: mail@libeurop.be  
URL: <http://www.libeurop.be>

**Moniteur belge/Belgisch Staatsblad**  
Rue de Louvain 40-42/Leuvenseweg 40-42  
B-1000 Bruxelles/Brussel  
Tél. (32-2) 552 22 11  
Fax (32-2) 511 01 84  
E-mail: eusales@just.fgov.be

DANMARK

**J. H. Schultz Information A/S**  
Herstedvang 4  
DK-2620 Albertslund  
Tlf. (45) 43 63 23 00  
Fax (45) 43 63 19 69  
E-mail: schultz@schultz.dk  
URL: <http://www.schultz.dk>

DEUTSCHLAND

**Bundesanzeiger Verlag GmbH**  
Vertriebsabteilung  
Amsterdamer Straße 192  
D-50735 Köln  
Tel. (49-221) 97 66 80  
Fax (49-221) 97 66 82 78  
E-Mail: vertrieb@bundesanzeiger.de  
URL: <http://www.bundesanzeiger.de>

ΕΛΛΑΔΑ/GREECE

**G. C. Eleftheroudakis SA**  
International Bookstore  
Panepistimiou 17  
GR-10564 Athina  
Tel. (30) 21 03 25 84 40  
Fax (30) 21 03 25 84 99  
E-mail: elebooks@books.gr  
URL: [www.books.gr](http://www.books.gr)

ESPAÑA

**Boletín Oficial del Estado**  
Trafalgar, 27  
E-28071 Madrid  
Tel. (34) 915 38 21 11 (libros), 913 84 17 15 (suscripción)  
Fax (34) 915 38 21 21 (libros), 913 84 17 14 (suscripción)  
E-mail: clientes@com.boe.es  
URL: <http://www.boe.es>

**Mundi Prensa Libros, SA**  
Castelló, 37  
E-28001 Madrid  
Tel. (34) 914 36 37 00  
Fax (34) 915 75 39 98  
E-mail: librenia@mundiprensa.es  
URL: <http://www.mundiprensa.com>

FRANCE

**Journal officiel**  
Service des publications des CE  
26, rue Desaix  
F-75727 Paris Cedex 15  
Tél. (33) 140 58 77 31  
Fax (33) 140 58 77 00  
E-mail: [europublications@journal-officiel.gouv.fr](mailto:europublications@journal-officiel.gouv.fr)  
URL: <http://www.journal-officiel.gouv.fr>

IRELAND

**Alan Hanna's Bookshop**  
270 Lower Rathmines Road  
Dublin 6  
Tel. (353-1) 496 73 98  
Fax (353-1) 496 02 28  
E-mail: hannas@iol.ie

ITALIA

**Licosa SpA**  
Via Duca di Calabria, 1/1  
Casella postale 552  
I-50125 Firenze  
Tel. (39) 05 56 48 31  
Fax (39) 055 64 12 57  
E-mail: licosa@licosa.com  
URL: <http://www.licosa.com>

LUXEMBOURG

**Messageries du livre SARL**  
5, rue Raiffeisen  
L-2411 Luxembourg  
Tél. (352) 40 10 20  
Fax (352) 49 06 61  
E-mail: mail@mdl.lu  
URL: <http://www.mdl.lu>

NEDERLAND

**SDU Servicecentrum Uitgevers**  
Christoffel Plantijnstraat 2  
Postbus 20014  
2500 EA Den Haag  
Tel. (31-70) 378 98 80  
Fax (31-70) 378 97 83  
E-mail: sdu@sdu.nl  
URL: <http://www.sdu.nl>

PORTUGAL

**Distribuidora de Livros Bertrand Ld.ª**  
Grupo Bertrand, SA  
Rua das Terras dos Vales, 4-A  
Apartado 60037  
P-2700 Amadora  
Tel. (351) 214 95 87 87  
Fax (351) 214 96 02 55  
E-mail: dlb@ip.pt

**Imprensa Nacional-Casa da Moeda, SA**  
Sector de Publicações Oficiais  
Rua da Escola Politécnica, 135  
P-1250 -100 Lisboa Codex  
Tel. (351) 213 94 57 00  
Fax (351) 213 94 57 50  
E-mail: spoc@incm.pt  
URL: <http://www.incm.pt>

SUOMI/FINLAND

**Akateeminen Kirjakauppa/  
Akademiska Bokhandeln**  
Keskuskatu 1/Centralgatan 1  
PL/PB 128  
FIN-00101 Helsinki/Helsingfors  
P./fn (358-9) 121 44 18  
F./fax (358-9) 121 44 35  
Sähköposti: akatilaus@akateeminen.com  
URL: <http://www.akateeminen.com>

SVERIGE

**BTJ AB**  
Traktorvägen 11-13  
S-221 82 Lund  
Tfn (46-46) 18 00 00  
Fax (46-46) 30 79 47  
E-post: btjeu-pub@btj.se  
URL: <http://www.btj.se>

UNITED KINGDOM

**The Stationery Office Ltd**  
Customer Services  
PO Box 29  
Norwich NR3 1GN  
Tel. (44-870) 60 05-522  
Fax (44-870) 60 05-533  
E-mail: [book.orders@theso.co.uk](mailto:book.orders@theso.co.uk)  
URL: <http://www.tso.co.uk>

ÍSLAND

**Bokabud Larusar Blöndal**  
Engjateigi 17-19  
IS-105 Reykjavik  
Tel. (354) 552 55 40  
Fax (354) 552 55 60  
E-mail: bokabud@simnet.is

NORGE

**Swets Blackwell AS**  
Hans Nielsen Hauges gt. 39  
Boks 4901 Nydalen  
N-0423 Oslo  
Tel. (47) 23 40 00 00  
Fax (47) 23 40 00 01  
E-mail: [info@no.swetsblackwell.com](mailto:info@no.swetsblackwell.com)

SCHWEIZ/SUISSE/SVIZZERA

**Euro Info Center Schweiz**  
c/o OSEC Business Network Switzerland  
Stampfenbachstraße 85  
PF 492  
CH-8035 Zürich  
Tel. (41-1) 365 53 15  
Fax (41-1) 365 54 11  
E-mail: eics@osec.ch  
URL: <http://www.osec.ch/eics>

BĂLGARIJA

**Europress Euromedia Ltd**  
59, blvd Vitosha  
BG-1000 Sofia  
Tel. (359-2) 980 37 66  
Fax (359-2) 980 42 30  
E-mail: Milena@mbox.cit.bg  
URL: <http://www.europress.bg>

CYPRUS

**Cyprus Chamber of Commerce  
and Industry**  
PO Box 21455  
CY-1509 Nicosia  
Tel. (357-22) 88 97 52  
Fax (357-22) 66 10 44  
E-mail: stalo@ccci.org.cy

EESTI

**Eesti Kaubandus-Tööstuskoda**  
(Estonian Chamber of Commerce and Industry)  
Toom-Kooli 17  
EE-10130 Tallinn  
Tel. (372) 646 02 44  
Fax (372) 646 02 45  
E-mail: einfo@koda.ee  
URL: <http://www.koda.ee>

HRVATSKA

**Mediatrade Ltd**  
Strohalov Prilaz 27  
HR-10000 Zagreb  
Tel. (385-1) 680 08 40  
Fax (385-1) 660 21 65  
E-mail: mediatrade@hi.hinet.hr

MAGYARORSZÁG

**Euro Info Service**  
Szt. István krt.12  
III emelet 1/A  
PO Box 1039  
H-1137 Budapest  
Tel. (36-1) 329 21 70  
Fax (36-1) 349 20 53  
E-mail: euroinfo@euroinfo.hu  
URL: <http://www.euroinfo.hu>

MALTA

**Miller Distributors Ltd**  
Malta International Airport  
PO Box 25  
Luqa LQA 05  
Tel. (356) 21 66 44 88  
Fax (356) 21 67 67 99  
E-mail: info@millermalta.com

POLSKA

**Ars Polona**  
Krakowskie Przedmiescie 7  
Skr. pocztowa 1001  
PL-00-950 Warszawa  
Tel. (48-22) 826 12 01  
Fax (48-22) 826 62 40  
E-mail: [books119@arspolona.com.pl](mailto:books119@arspolona.com.pl)

ROMÂNIA

**Euromedia**  
Str. Dionisie Lupu nr. 65, sector 1  
RO-70184 Bucuresti  
Tel. (40-21) 260 28 82  
Fax (40-21) 260 27 88  
E-mail: euromedia@mailcity.com

SLOVAKIA

**Centrum VTI SR**  
Námestie Slobody 19  
SK-81223 Bratislava 1  
Tel. (421-2) 54 41 83 64  
Fax (421-2) 54 41 83 64  
E-mail: europ@tbb1.cvtisr.sk  
URL: <http://www.cvtisr.sk>

SLOVENIJA

**GV Zalozba d.o.o.**  
Dunajska cesta 5  
SI-1000 Ljubljana  
Tel. (386) 13 09 1800  
Fax (386) 13 09 1805  
E-mail: europ@gvzalozba.si  
URL: <http://www.gvzalozba.si>

TÜRKIYE

**Dünya Aktüel A.S**  
Globus Dünya Basinevi  
100, Yil Mahallesi 34440  
TR-80050 Bagcilar-Istanbul  
Tel. (90-212) 440 22 27  
Fax (90-212) 440 23 67  
E-mail: aktuel.info@dunya.com

ARGENTINA

**World Publications SA**  
Av. Córdoba 1877  
C1120 AAA Buenos Aires  
Tel. (54-11) 48 15 81 56  
Fax (54-11) 48 15 81 56  
E-mail: wpbooks@infovia.com.ar  
URL: <http://www.wpbooks.com.ar>

AUSTRALIA

**Hunter Publications**  
PO Box 404  
Abbotsford, Victoria 3067  
Tel. (61-3) 94 17 53 61  
Fax (61-3) 94 19 71 54  
E-mail: admin@tekimaging.com.au

BRASIL

**Livraria Camões**  
Rua Bittencourt da Silva, 12 C  
CEP  
20043-900 Rio de Janeiro  
Tel. (55-21) 262 47 76  
Fax (55-21) 262 47 76  
E-mail: livraria.camoes@incm.com.br  
URL: <http://www.incm.com.br>

CANADA

**Les éditions La Liberté Inc.**  
3020, chemin Sainte-Foy  
Sainte-Foy, Québec G1X 3V6  
Tél. (1-418) 658 37 63  
Fax (1-800) 567 54 49  
E-mail: liberte@mediom.qc.ca

Renouf Publishing Co. Ltd

5369 Chemin Canotek Road Unit 1  
Ottawa, Ontario K1J 9J3  
Tel. (1-613) 745 26 65  
Fax (1-613) 745 76 60  
E-mail: order.dept@renoufbooks.com  
URL: <http://www.renoufbooks.com>

EGYPT

The Middle East Observer

41 Sherif Street  
11111 Cairo  
Tel. (20-2) 392 69 19  
Fax (20-2) 393 97 32  
E-mail: meo@soficom.com.eg  
URL: <http://www.meobserver.com.eg>

MALAYSIA

EBIC Malaysia

Suite 47.01, Level 47  
Bangunan AmFinance (letter box 47)  
8 Jalan Yap Kwan Seng  
50450 Kuala Lumpur  
Tel. (60-3) 21 62 62 98  
Fax (60-3) 21 62 61 98  
E-mail: ebic@tm.net.my

MÉXICO

Mundi Prensa México, SA de CV

Río Pánuco, 141  
Colonia Cuauhtémoc  
MX-06500 México, DF  
Tel. (52-5) 533 56 58  
Fax (52-5) 514 67 99  
E-mail: 101545.2361@compuserve.com

SOUTH KOREA

The European Union Chamber of  
Commerce in Korea

Suite 2004, Kyobo Bldg.  
1 Chongro 1-Ga, Chongro-Gu  
Seoul 110-714  
Tel. (82-2) 725-9880/5  
Fax (82-2) 725-9886  
E-mail: euock@euock.org  
URL: <http://www.euock.org>

SRI LANKA

EBIC Sri Lanka

Trans Asia Hotel  
115 Sir Chittampalam  
A. Gardiner Mawatha  
Colombo 2  
Tel. (94-1) 074 71 50 78  
Fax (94-1) 44 87 79  
E-mail: ebicsl@sltnet.lk

T'AI-WAN

Tycoon Information Inc

PO Box 81-466  
105 Taipei  
Tel. (886-2) 87 12 88 86  
Fax (886-2) 87 12 47 47  
E-mail: elutpe@ms21.hinet.net

UNITED STATES OF AMERICA

Bernan Associates

4611-F Assembly Drive  
Lanham MD 20706-4391  
Tel. (1-800) 274 44 47 (toll free telephone)  
Fax (1-800) 865 34 50 (toll free fax)  
E-mail: query@bernan.com  
URL: <http://www.bernan.com>

ANDERE LÄNDER/OTHER COUNTRIES/  
AUTRES PAYS

Bitte wenden Sie sich an ein Büro Ihrer  
Wahl/Please contact the sales office of  
your choice/Veuillez vous adresser au  
bureau de vente de votre choix

**Office for Official Publications  
of the European Communities**  
2, rue Mercier  
L-2985 Luxembourg  
Tel. (352) 29 29-42001  
Fax (352) 29 29-42700  
E-mail: info-info-opoce@cec.eu.int  
URL: <http://publications.eu.int>

