ANNEX I

ELEMENTS OF THE UNION RAIL SYSTEM

1. Network

For the purposes of this Directive, the Union's network shall include the following elements:

- (a) specially built high-speed lines equipped for speeds generally equal to or greater than 250 km/h;
- (b) specially upgraded high-speed lines equipped for speeds of the order of 200 km/h;
- (c) specially upgraded high-speed lines which have special features as a result of topographical, relief or town-planning constraints, to which the speed must be adapted in each case. This category includes interconnecting lines between high-speed and conventional networks, lines through stations, accesses to terminals, depots, etc. travelled at conventional speed by 'high-speed' rolling stock;
- (d) conventional lines intended for passenger services;
- (e) conventional lines intended for mixed traffic (passengers and freight);
- (f) conventional lines intended for freight services;
- (g) passenger hubs;
- (h) freight hubs, including intermodal terminals;
- (i) lines connecting the abovementioned elements.

This network includes traffic management, tracking and navigation systems, technical installations for data processing and telecommunications intended for long-distance passenger services and freight services on the network in order to guarantee the safe and harmonious operation of the network and efficient traffic management.

2. Vehicles

For the purposes of this Directive, Union vehicles shall comprise all vehicles likely to travel on all or part of the Union's network:

- locomotives and passenger rolling stock, including thermal or electric traction units, self-propelling thermal or electric passenger trains, and passenger coaches;
- freight wagons, including low-deck vehicles designed for the entire network and vehicles designed to carry lorries;
- special vehicles, such as on-track machines.

This list of vehicles shall include those which are specially designed to operate on the different types of high-speed lines described in point 1.

ANNEX II

SUBSYSTEMS

1. List of subsystems

For the purposes of this Directive, the system constituting the Union rail system may be broken down into the following subsystems, either:

- (a) structural areas:
 - infrastructure,
 - energy,
 - trackside control-command and signalling,
 - on-board control-command and signalling,
 - rolling stock; or
- (b) functional areas:
 - operation and traffic management,
 - maintenance,
 - telematics applications for passenger and freight services.

2. **Description of the subsystems**

For each subsystem or part of a subsystem, the list of constituents and aspects relating to interoperability is proposed by the Agency at the time of drawing up the relevant draft TSI. Without prejudging the choice of aspects and constituents relating to interoperability or the order in which they will be made subject to TSIs, the subsystems include the following:

2.1. *Infrastructure*

The track, points, level crossings, engineering structures (bridges, tunnels, etc.), rail-related elements of stations (including entrances, platforms, zones of access, service venues, toilets and information systems, as well as their accessibility features for persons with disabilities and persons with reduced mobility), safety and protective equipment.

2.2. Energy

The electrification system, including overhead lines and the trackside electricity consumption measuring and charging system.

2.3. Trackside control-command and signalling

All the trackside equipment required to ensure safety and to command and control movements of trains authorised to travel on the network.

2.4. On-board control-command and signalling

All the on-board equipment required to ensure safety and to command and control movements of trains authorised to travel on the network.

2.5. *Operation and traffic management*

The procedures and related equipment permitting coherent operation of the various structural subsystems, during both normal and degraded operation, including in particular train composition and train driving, traffic planning and management.

The professional qualifications which may be required for carrying out any type of railway service.

2.6. *Telematics applications*

In accordance with Annex I, this subsystem comprises two elements:

- (a) applications for passenger services, including systems which provide passengers with information before and during the journey, reservation and payment systems, luggage management and management of connections between trains and with other modes of transport;
- (b) applications for freight services, including information systems (real-time monitoring of freight and trains), marshalling and allocation systems, reservation, payment and invoicing systems, management of connections with other modes of transport and production of electronic accompanying documents.

2.7. *Rolling stock*

Structural body, command and control system for all train equipment, electric current collection devices, traction and energy conversion units, on-board equipment for electricity consumption measuring and charging, braking, coupling and running gear (bogies, axles, etc.) and suspension, doors, man/machine interfaces (driver, on-board staff and passengers, including accessibility features for persons with disabilities and persons with reduced mobility), passive or active safety devices and requisites for the health of passengers and on-board staff.

2.8. *Maintenance*

The procedures, associated equipment, logistics centres for maintenance work and reserves providing the mandatory corrective and preventive maintenance to ensure the interoperability of the Union rail system and guarantee the performance required.

ANNEX III

ESSENTIAL REQUIREMENTS

1. General requirements

1.1. Safety

- 1.1.1. The design, construction or assembly, maintenance and monitoring of safety-critical components, and more particularly of the components involved in train movements, must be such as to guarantee safety at the level corresponding to the aims laid down for the network, including those for specific degraded situations.
- 1.1.2. The parameters involved in the wheel/rail contact must meet the stability requirements needed in order to guarantee safe movement at the maximum authorised speed. The parameters of brake equipment must guarantee that it is possible to stop within a given brake distance at the maximum authorised speed.
- 1.1.3. The components used must withstand any normal or exceptional stresses that have been specified during their period in service. The safety repercussions of any accidental failures must be limited by appropriate means.
- 1.1.4. The design of fixed installations and rolling stock and the choice of the materials used must be aimed at limiting the generation, propagation and effects of fire and smoke in the event of a fire.
- 1.1.5. Any devices intended to be handled by users must be designed in such a way as not to impair the safe operation of the devices or the health and safety of users if used in a foreseeable manner, albeit not in accordance with the posted instructions.

1.2. *Reliability and availability*

The monitoring and maintenance of fixed or movable components that are involved in train movements must be organised, carried out and quantified in such a manner as to maintain their operation under the intended conditions.

- 1.3. *Health*
- 1.3.1. Materials likely, by virtue of the way they are used, to constitute a health hazard to those having access to them must not be used in trains and railway infrastructures.
- 1.3.2. Those materials must be selected, deployed and used in such a way as to restrict the emission of harmful and dangerous fumes or gases, particularly in the event of fire.
- 1.4. *Environmental protection*
- 1.4.1. The environmental impact of establishment and operation of the rail system must be assessed and taken into account at the design stage of the system in accordance with Union law.
- 1.4.2. The materials used in the trains and infrastructures must prevent the emission of fumes or gases which are harmful and dangerous to the environment, particularly in the event of fire.
- 1.4.3. The rolling stock and energy-supply systems must be designed and manufactured in such a way as to be electromagnetically compatible with the installations, equipment and public or private networks with which they might interfere.
- 1.4.4. The design and operation of the rail system must not lead to an inadmissible level of noise generated by it:
- in areas close to railway infrastructure, as defined in point (3) of Article 3 of Directive 2012/34/EU, and
- in the driver's cab.
- 1.4.5. Operation of the rail system must not give rise to an inadmissible level of ground vibrations for the activities and areas close to the infrastructure and in a normal state of maintenance.
- 1.5. *Technical compatibility*

The technical characteristics of the infrastructure and fixed installations must be compatible with each other and with those of the trains to be used on the rail system. This requirement includes the safe integration of the vehicle's subsystem with the infrastructure.

If compliance with these characteristics proves difficult on certain sections of the network, temporary solutions, which ensure compatibility in the future, may be implemented.

- 1.6. Accessibility
- 1.6.1. The 'infrastructure' and 'rolling stock' subsystems must be accessible to persons with disabilities and persons with reduced mobility in order to ensure access on an equal basis with others by way of the prevention or removal of barriers, and by way of other appropriate measures. This shall include the design, construction, renewal, upgrade, maintenance and operation of the relevant parts of the subsystems to which the public has access.

1.6.2. The 'operations' and 'telematics applications for passengers' subsystems must provide for the necessary functionality required to facilitate access for persons with disabilities and persons with reduced mobility on an equal basis with others by way of the prevention or removal of barriers, and by way of other appropriate measures.

2. **Requirements specific to each subsystem**

- 2.1. *Infrastructure*
- 2.1.1. *Safety*

Appropriate steps must be taken to prevent access to, or undesirable intrusions into, installations.

Steps must be taken to limit the dangers to which persons are exposed, particularly when trains pass through stations.

Infrastructure to which the public has access must be designed and made in such a way as to limit any human safety hazards (stability, fire, access, evacuation, platforms, etc.).

Appropriate provisions must be laid down to take account of the particular safety conditions in very long tunnels and viaducts.

2.1.2. Accessibility

Infrastructure subsystems to which the public has access must be accessible for persons with disabilities and persons with reduced mobility in accordance with point 1.6.

2.2. Energy

2.2.1. *Safety*

Operation of the energy-supply systems must not impair the safety either of trains or of persons (users, operating staff, trackside dwellers and third parties).

2.2.2. Environmental protection

The functioning of the electrical or thermal energy-supply systems must not interfere with the environment beyond the specified limits.

2.2.3. Technical compatibility

The electricity/thermal energy-supply systems used must:

- enable trains to achieve the specified performance levels,
- in the case of electricity energy-supply systems, be compatible with the collection devices fitted to the trains.
- 2.3. *Control-command and signalling*
- 2.3.1. *Safety*

The control-command and signalling installations and procedures used must enable trains to travel with a level of safety which corresponds to the objectives set for the network. The control-command and signalling systems must continue to provide for safe passage of trains permitted to run under degraded conditions.

2.3.2. *Technical compatibility*

All new infrastructure and all new rolling stock manufactured or developed after adoption of compatible control-command and signalling systems must be tailored to the use of those systems.

The control-command and signalling equipment installed in the train drivers' cabs must permit normal operation, under the specified conditions, throughout the rail system.

- 2.4. *Rolling stock*
- 2.4.1. *Safety*

The rolling-stock structures and those of the links between vehicles must be designed in such a way as to protect the passenger and driving compartments in the event of collision or derailment.

The electrical equipment must not impair the safety and functioning of the control-command and signalling installations.

The braking techniques and the stresses exerted must be compatible with the design of the tracks, engineering structures and signalling systems.

Steps must be taken to prevent access to electrically-live constituents in order not to endanger the safety of persons.

In the event of danger, devices must enable passengers to inform the driver and accompanying staff to contact them.

The safety of passengers boarding and alighting from trains must be ensured. The access doors must incorporate an opening and closing system which guarantees passenger safety.

Emergency exits must be provided and indicated.

Appropriate provisions must be laid down to take account of the particular safety conditions in very long tunnels.

An emergency lighting system having a sufficient intensity and duration is an absolute requirement on board trains.

Trains must be equipped with a public address system which provides a means of communication to the public from on-board staff.

Passengers must be given easily understandable and comprehensive information about rules applicable to them both in railway stations and in trains.

2.4.2. *Reliability and availability*

The design of the vital equipment and the running, traction and braking equipment as well as the control-command system must, in a specific degraded situation, be such as to enable the train to continue without adverse consequences for the equipment remaining in service.

2.4.3. *Technical compatibility*

The electrical equipment must be compatible with the operation of the control-command and signalling installations.

In the case of electric traction, the characteristics of the current-collection devices must be such as to enable trains to travel under the energy-supply systems for the rail system.

The characteristics of the rolling stock must be such as to allow it to travel on any line on which it is expected to operate, taking account of relevant climatic conditions.

2.4.4. Controls

Trains must be equipped with a recording device. The data collected by that device and the processing of the information must be harmonised.

2.4.5. Accessibility

Rolling-stock subsystems to which the public has access must be accessible for persons with disabilities and persons with reduced mobility in accordance with point 1.6.

2.5. *Maintenance*

2.5.1. *Health and safety*

The technical installations and the procedures used in the centres must ensure the safe operation of the subsystem and not constitute a danger to health and safety.

2.5.2. Environmental protection

The technical installations and the procedures used in the maintenance centres must not exceed the permissible levels of nuisance with regard to the surrounding environment.

2.5.3. Technical compatibility

The maintenance installations for rolling stock must be such as to enable safety, health and comfort operations to be carried out on all stock for which they have been designed.

2.6. *Operation and traffic management*

2.6.1. Safety

Alignment of the network operating rules and the qualifications of drivers and on-board staff and of the staff in the control centres must be such as to ensure safe operation, bearing in mind the different requirements of cross-border and domestic services.

The maintenance operations and intervals, the training and qualifications of the maintenance and control centre staff and the quality assurance system set up by the operators concerned in the control and maintenance centres must be such as to ensure a high level of safety.

2.6.2. *Reliability and availability*

The maintenance operations and periods, the training and qualifications of the maintenance and control centre staff and the quality assurance system set up by the operators concerned in the control and maintenance centres must be such as to ensure a high level of system reliability and availability.

2.6.3. *Technical compatibility*

Alignment of the network operating rules and the qualifications of drivers, on-board staff and traffic managers must be such as to ensure operating efficiency on the rail system, bearing in mind the different requirements of cross-border and domestic services.

2.6.4. *Accessibility*

Appropriate steps must be taken to ensure that operating rules provide for the necessary functionality required to ensure accessibility for persons with disabilities and persons with reduced mobility.

2.7. Telematics applications for freight and passengers

2.7.1. Technical compatibility

The essential requirements for telematics applications guarantee a minimum quality of service for passengers and carriers of goods, particularly in terms of technical compatibility.

Steps must be taken to ensure:

- that the databases, software and data communication protocols are developed in a manner allowing maximum data interchange between different applications and operators, excluding confidential commercial data,
- easy access to the information for users.

2.7.2. Reliability and availability

The methods of use, management, updating and maintenance of these databases, software and data communication protocols must guarantee the efficiency of these systems and the quality of the service.

2.7.3. *Health*

The interfaces between these systems and users must comply with the minimum rules on ergonomics and health protection.

2.7.4. *Safety*

Suitable levels of integrity and dependability must be provided for the storage or transmission of safety-related information.

2.7.5. *Accessibility*

Appropriate steps must be taken to ensure that telematics applications for passenger subsystems provide for the necessary functionality required to ensure accessibility for persons with disabilities and persons with reduced mobility.

ANNEX IV

'EC' VERIFICATION PROCEDURE FOR SUBSYSTEMS

1. GENERAL PRINCIPLES

"EC" verification' means a procedure carried out by the applicant within the meaning of Article 15 to demonstrate that the requirements of the relevant Union law and any relevant national rules relating to a subsystem have been fulfilled and the subsystem may be authorised to be placed in service.

2. CERTIFICATE OF VERIFICATION ISSUED BY A NOTIFIED BODY

2.1. Introduction

For the purpose of this Directive, the verification by reference to TSIs is the procedure whereby a notified body checks and certifies that the subsystem complies with the relevant technical specifications for interoperability (TSI).

This is without prejudice to the obligations of the applicant to comply with the other applicable legal acts of the Union and any verifications by the assessment bodies required by the other rules.

2.2. Intermediate statement of verification (ISV)

2.2.1 *Principles*

At the request of the applicant the verifications may be done for parts of a subsystem or may be limited to certain stages of the verification procedure. In these cases, the results of verification may be documented in an 'intermediate statement of verification' (ISV) issued by the notified body chosen by the applicant. The ISV must provide reference to the TSIs with which the conformity has been assessed.

2.2.2 *Parts of the subsystem*

The applicant may apply for an ISV for any part into which he decides to split the subsystem. Each part shall be checked at each stage as set out in point 2.2.3.

2.2.3 *Stages of the verification procedure*

The subsystem, or certain parts of the subsystem, shall be checked at each of the following stages:

- (a) overall design;
- (b) production: construction, including, in particular, civil-engineering activities, manufacturing, constituent assembly and overall adjustment;
- (c) final testing.

The applicant may apply for an ISV for the design stage (including the type tests) and for the production stage for the whole subsystem or for any part into which the applicant decided to split it (see point 2.2.2).

2.3. **Certificate of verification**

2.3.1. The notified bodies responsible for the verification assess the design, production and final testing of the subsystem and draw up the certificate of verification intended for the applicant who in turn draws up the 'EC' declaration of verification. The certificate of verification must provide reference to the TSIs with which the conformity has been assessed.

Where a subsystem has not been assessed for its conformity with all relevant TSI(s) (e.g. in the case of a derogation, partial application of TSIs for upgrade or renewal, transitional period in a TSI or specific case), the certificate of verification shall give the precise reference to the TSI(s) or their parts whose conformity has not been examined by the notified body during the verification procedure.

- 2.3.2. Where ISV have been issued, the notified body responsible for the verification of the subsystem takes these ISV into account, and, before issuing its certificate of verification:
- (a) verifies that the ISV cover correctly the relevant requirements of the TSI(s);
- (b) checks all aspects that are not covered by the ISV; and
- (c) checks the final testing of the subsystem as a whole.
- 2.3.3. In the case of a modification to a subsystem already covered by a certificate of verification, the notified body shall perform only those examinations and tests that are

relevant and necessary, i.e. assessment shall relate only to the parts of the subsystem that are changed and their interfaces to the unchanged parts of the subsystem.

2.3.4 Each notified body involved in the verification of a subsystem shall draw up a file in accordance with Article 15(4) covering the scope of its activities.

2.4. Technical file accompanying the 'EC' declaration of verification.

The technical file accompanying the 'EC' declaration of verification shall be assembled by the applicant and must contain the following:

- (a) technical characteristics linked to the design including general and detailed drawings with respect to execution, electrical and hydraulic diagrams, control-circuit diagrams, description of data-processing and automatic systems to the level of detail sufficient for documenting the verification of conformity carried out, documentation on operation and maintenance, etc., relevant for the subsystem concerned;
- (b) a list of interoperability constituents, referred to in point (d) of Article 4(3), incorporated into the subsystem;
- (c) the files referred to in Article 15(4), compiled by each of the notified bodies involved in the verification of the subsystem, which shall include:
 - copies of the 'EC' declarations of verification and, where applicable, 'EC' declarations of suitability for use established for interoperability constituents referred to in point (d) of Article 4(3) and accompanied, where appropriate, by the corresponding calculation notes and a copy of the records of the tests and examinations carried out by the notified bodies on the basis of the common technical specifications,
 - where available, the ISV that accompany the certificate of verification, including the result of verification by the notified body of the ISV validity,
- (d) certificates of verification issued in accordance with other legal acts of the Union;
- (e) when verification of safe integration is required pursuant to in point (c) of Article 18(4) and in point (c) of Article 21(3), the relevant technical file shall include the assessors' report(s) on the CSMs on risk assessment referred to in Article 6(3) of Directive $2004/49/\text{EC}^{(1)}$.

2.5. Surveillance by notified bodies.

- 2.5.1. The notified body responsible for checking production must have permanent access to building sites, production workshops, storage areas and, where appropriate, prefabrication or testing facilities and, more generally, to all premises which it considers necessary for its task. The notified body must receive from the applicant all the documents needed for that purpose and, in particular, the implementation plans and technical documentation concerning the subsystem.
- 2.5.2. The notified body responsible for checking implementation must periodically carry out audits in order to confirm compliance with the relevant TSI(s). It must provide

those responsible for implementation with an audit report. Its presence may be required at certain stages of the building operations.

- 2.5.3. In addition, the notified body may pay unexpected visits to the worksite or to the production workshops. At the time of such visits the notified body may conduct complete or partial audits. It must provide those responsible for implementation with an inspection report and, if appropriate, an audit report.
- 2.5.4. The notified body shall be able to monitor a subsystem on which an interoperability constituent is mounted in order to assess, where required by the corresponding TSI, its suitability for use in its intended railway environment.

2.6. Submission

A copy of the technical file accompanying the 'EC' declaration of verification must be kept by the applicant) throughout the service life of the subsystem. It must be sent to any Member State or the Agency, upon request.

The documentation submitted for an application for an authorisation for placing in service shall be submitted to the authority where the authorisation is sought. The national safety authority or the Agency may request that part(s) of the documents submitted together with the authorisation is/are translated into its own language.

2.7. **Publication**

Each notified body must periodically publish relevant information concerning:

- (a) requests for verification and ISV received;
- (b) request for assessment of conformity and suitability for use of ICs;
- (c) ISV issued or refused;
- (d) certificates of verification and 'EC' certificates for suitability for use issued or refused;
- (e) certificates of verification issued or refused.

2.8. Language

The files and correspondence relating to the 'EC' verification procedure must be written in a Union official language of the Member State in which the applicant is established or in a Union official language accepted by the applicant

3. CERTIFICATE OF VERIFICATION ISSUED BY A DESIGNATED BODY

3.1. Introduction

In the case where national rules apply, the verification shall include a procedure whereby the body designated pursuant to Article 15(8), (the designated body) checks and certifies that the subsystem complies with the national rules notified in accordance with Article 14 for each Member State in which the subsystem is intended to be authorised to be placed in service.

3.2. Certificate of verification

The designated body draws up the certificate of verification intended for the applicant.

The certificate shall contain a precise reference to the national rule(s) whose conformity has been examined by the designated body in the verification process.

In the case of national rules related to the subsystems composing a vehicle, the designated body shall divide the certificate into two parts, one part including the references to those national rules strictly related to the technical compatibility between the vehicle and the network concerned, and the other part for all other national rules.

3.3. File

The file compiled by the designated body and accompanying the certificate of verification in the case of national rules must be included in the technical file accompanying the 'EC' declaration of verification referred to in point 2.4 and shall contain the technical data relevant for the assessment of the conformity of the subsystem with those national rules.

3.4. Language

The files and correspondence relating to the 'EC' verification procedure must be written in a Union official language of the Member State in which the applicant is established or in a Union official language accepted by the applicant.

4. VERIFICATION OF PARTS OF SUBSYSTEMS IN ACCORDANCE WITH ARTICLE 15(7)

If a certificate of verification is to be issued for certain parts of a subsystem, provisions for this Annex shall apply mutatis mutandis for those parts.

ANNEX V

PART A

Repealed Directives with list of the successive amendments thereto

(referred to in Article 58)

Directive 2008/57/EC	(OJ L 191, 18.7.2008, p. 1.)
Directive 2009/131/EC	(OJ L 273, 17.10.2009, p. 12.)
Directive 2011/18/EU	(OJ L 57, 2.3.2011, p. 21.)

PART B

Time limits for transposition into national law

(referred to in Article 57)

Directive	Deadline for transposition
2008/57/EC	19 July 2010
2009/131/EC	19 July 2010
2011/18/EU	31 December 2011

ANNEX VI

Correlation table

Directive 2008/57/EC	This Directive
Article 1	Article 1
Article 2(a) to (z)	Article 2(1) to (5), (7) to (17) and (19) to (28)
	Article 2(6), (18) and (29) to (45)
Article 3	
Article 4	Article 3
Article 5(1) to (3)(g)	Article 4(1) to (3)(g)
	Article 4(3)(h) and (i)
Article 5(4) to (8)	Article 4(4) to (8)
Article 6	Article 5
Article 7	Article 6
Article 8	
Article 9	Article 7
Article 10	Article 8
Article 11	Article 9
Article 12	
Article 13	Article 10
Article 14	Article 11
Article 15(1)	Articles 18(2)
Article 15(2) and (3)	
Article 16	Article 12
Article 17	Articles 13 and 14
Article 18	Article 15
Article 19	Article 16
	Article 17
	Article 18 (except 18(3))
	Articles 19, 20, 21, 22 and 23
Article 20	
Article 21	
Articles 22 to 25	
Article 26	Article 24
Article 27	Article 14(10)

	Article 26
Article 28 and Annex VIII	Articles 27 to 44
	Article 45
Article 29	Article 51
Articles 30 and 31	
Article 32	Article 46
Article 33	Article 47(3), (4), (6) and (7)
	Article 47(1), (2) and (5)
Article 34	Article 48
Article 35	Article 49
Article 36	
	Article 50-
Article 37	Article 52
Article 38	Article 57
Article 39	Article 53
	Articles 54 and 55
	Article 56
Article 40	Article 58
Article 41	Article 59
Article 42	Article 60
Annex I to III	Annex I to III
Annex IV	Article 9(2)
Annex V	Article 15(9)
Annex VI	Annex IV
Annex VII	Article 14(10)
Annex VIII	Articles 30, 31 and 32
Annex IX	Article 7(5)
Annex X	Annex V
Annex XI	Annex VI

(1) Directive 2004/49/EC of the European Parliament and of the Council of 29 April 2004 on safety on the Community's railways and amending Council Directive 95/18/EC on the licensing of railway undertakings and Directive 2001/14/EC on the allocation of railway infrastructure capacity and the levying of charges for the use of railway infrastructure and safety certification (Railway Safety Directive) (OJ L 164, 30.4.2004, p. 44).