

Overview current TSI Freight Wagon and perspective for the future

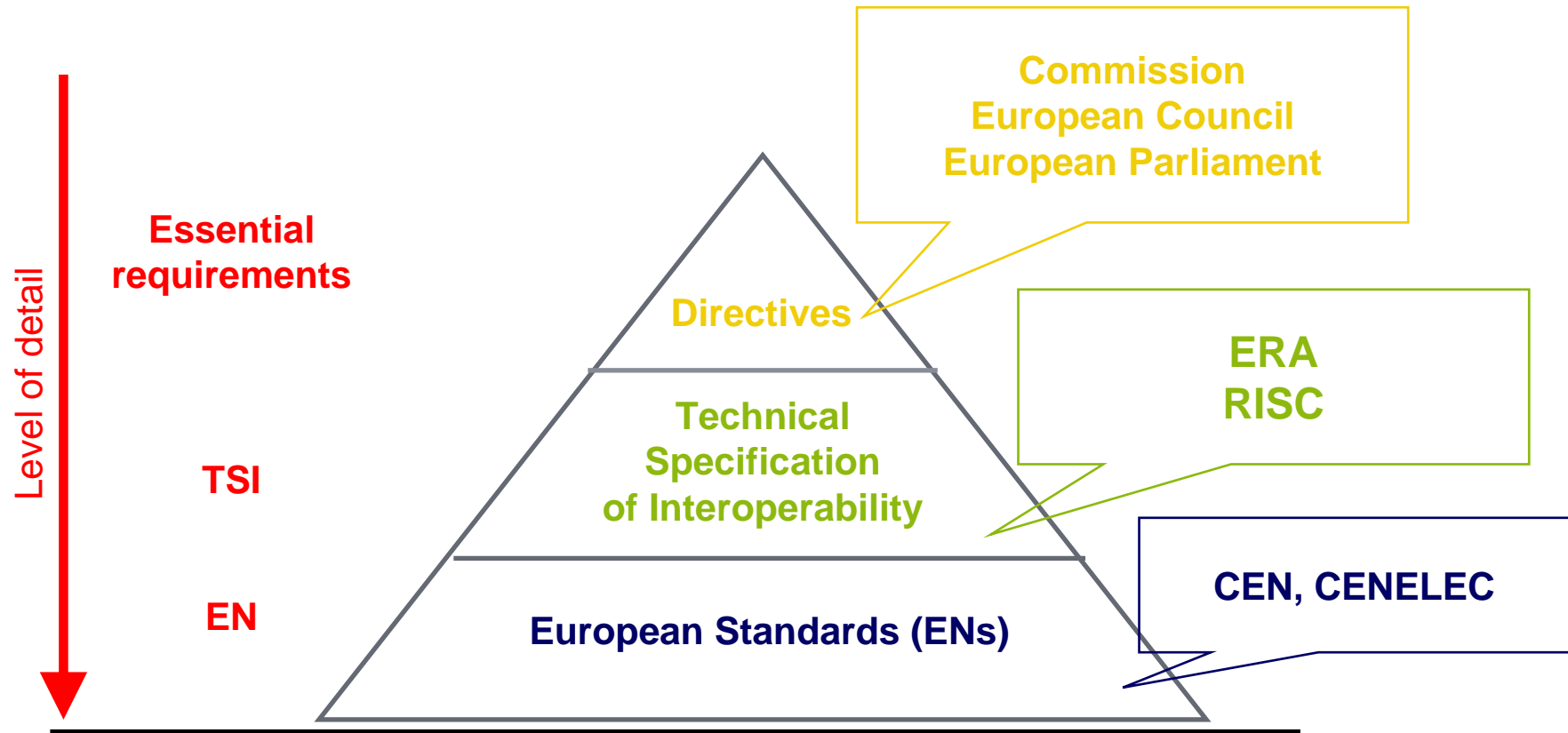
DB AG

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Structure of Interoperability rules and standards



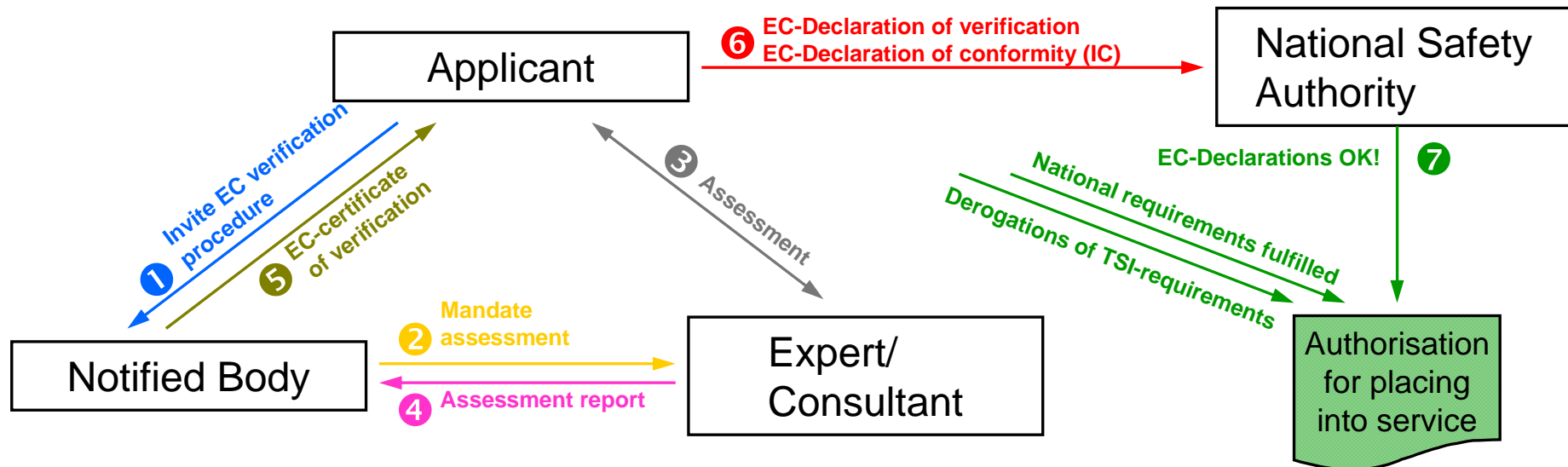
What is Interoperability?

'interoperability' means...

...the ability of a rail system to allow the **safe and uninterrupted** movement of **trains** which accomplish the required levels of performance for these lines. This **ability** depends on all the regulatory, **technical and operational conditions** which must be met in order to satisfy the essential requirements;

(Art. 2 Directive 2008/57/EG from 19.07.2008)

Interoperability will be implemented by the process of authorisation of placing into service



Contents of a TSI

1. Introduction with technical and geographical scope
2. Definition of subsystem
3. Essential requirements
4. Characterisation of the subsystem
 - 4.2. Functional and technical specifications of the subsystem
 - 4.3. Functional and technical specifications of the interfaces (= other TSIs)
 - 4.4.-4.7 Rules for operation, maintenance, professional qualifications, health and safety conditions
 - 4.8. Infrastructure and rolling stock register
5. Interoperability Constituents
6. Assessment of conformity and/or suitability for use of the constituents (6.1) and verification of the subsystem (6.2)
7. Implementation (strategy [differentiation new RST, renewal, upgrading], time schedule, bi- or multilateral agreements, placing into service, specific cases)

Annexes

TSI WAG significant contents

1. INTRODUCTION

1.1. TECHNICAL SCOPE

-> Freight wagons

1.2. GEOGRAPHICAL SCOPE

-> TEN-Network (Decision 1692/96/EC)

1.3. CONTENT OF THIS TSI

-> short description of content of chapters 2-7 of the TSI

TSI WAG significant contents

2. DEFINITION OF SUBSYSTEM/SCOPE

2.1. DEFINITION OF SUBSYSTEM

-> **New, upgraded or renewed** freight wagons on conventional rail network

2.2. FUNCTIONS OF SUBSYSTEM

-> load freight, move rolling stock, maintenance data, operate a train, service for customers

2.3. INTERFACES OF SUBSYSTEM

-> general list of items with interfaces to other TSIs (e. g. hot axle box in TSI CCS)

-> requirements coming from that interfaces are described in 4.3

TSI WAG significant contents

3. ESSENTIAL REQUIREMENTS

3.1. GENERAL

- > compliance of chapters 4-6 = fulfilling essential requirements
- > open points of TSI and specific cases assessed by Member State (MS)

3.2. THE ESSENTIAL REQUIREMENTS RELATE TO:

- Safety
- Reliability and availability
- Health
- Environmental protection
- Technical compatibility

defined in Directive 2008/57/EC, Annex III with:

1. General requirements
2. Requirements specific to each subsystem (incl. e. g. maintenance + operation and traffic management)

TSI WAG significant contents

3.3. *GENERAL REQUIREMENTS*

List of **general** essential requirements and the related chapters of this TSI satisfying them and exemption of requirements

3.4. *REQUIREMENTS SPECIFIC TO THE ROLLING STOCK SUBSYSTEM*

List of **specific** essential requirements for freight wagons and the related chapters of this TSI satisfying them and exemption of requirements (e. g. related to passengers)

3.5. *REQUIREMENTS SPECIFIC TO MAINTENANCE*

List of essential **maintenance** requirements and the related chapters of this TSI satisfying them and exemption of requirements

3.6. *REQUIREMENTS SPECIFIC TO OTHER SUBSYSTEMS CONCERNING ALSO THE ROLLING STOCK SUBSYSTEM*

List of **specific** essential requirements from other TSIs and the related chapters of this TSI satisfying them and exemption of requirements

TSI WAG significant contents

4. CHARACTERISATION OF THE SUBSYSTEM

4.1. INTRODUCTION

- > Subsystem freight wagon is part of rail system and integration shall be verified
- > functional specifications of 4.2 and 4.3 only impose specific technologies if necessary for interoperability
- > innovations are handled in 6.1.2.3 and 6.2.2.2

4.2. FUNCTIONAL AND TECHNICAL SPECIFICATIONS OF THE SUBSYSTEM

4.2.1. GENERAL

List of arrangement of the freight wagon and for that described in detail in the following paragraphs

- Structures and mechanical parts
- Vehicle track interaction and gauging
- Braking
- Communication
- Environmental conditions
- System protection
- Maintenance

TSI WAG significant contents

4.2.2. STRUCTURES AND MECHANICAL PARTS

4.2.2. STRUCTURES AND MECHANICAL PARTS:

4.2.2.1. *Interface (e. g. Coupling) between vehicles, between set of vehicles and between trains*

-> Wagons shall have resilient buffing and draw gear at both ends.

-> 'UIC' side buffers and screw coupler are not mandatory, but requirements are mandatory if equipped with them

-> specifications for

- height above rail level of buffers and screw coupler
- distance between buffers,
- acceptable overlap of buffers
- same design/type on one wagon
- buffer stroke
- buffer head radius
- forces and breaking strength
- geometrical dimensions
- ability of safe transit in curves with defined radius and forces

-> values are coming from UIC leaflets

-> **general remark: 'coming from UIC leaflets' means summarisation not complete copy**

TSI WAG significant contents

4.2.2. STRUCTURES AND MECHANICAL PARTS

4.2.2.2. *Safe access and egress for rolling stock*

-> specifications for safety of staff (during coupling and shunting):

- Bern rectangle
- clearance for draw hook
- clearance for compressed buffers
- steps and handrails with geometrical dimensions

-> values are coming from UIC leaflets

TSI WAG significant contents

4.2.2. STRUCTURES AND MECHANICAL PARTS

4.2.2.3. *Strength of Main Vehicle Structure and Securing of Freight*

-> specifications coming from EN 12663 which is generally in line with UIC 577 and B12/RP 17 containing exceptional loads:

- Two categories (without and with shunting restrictions)
- Longitudinal design loads (e.g. compressive force at buffer height and/or coupler height)
- Maximum vertical load (maximum operating load)
- Load combinations (combinations of longitudinal and vertical loads)
- Lifting and jacking (with defined mass of wagon)
- Equipment attachment including body/bogie (required accelerations-> buffing test)
- Other exceptional loads (examples wagons with load cases)

-> specifications for service (fatigue) loads

-> specifications for stiffness of main vehicle structure (deflections, vibration, torsional stiffness, vibration of equipment)

-> securing of freight (examples for common types of features, e. g. spigots)

TSI WAG significant contents

4.2.2. STRUCTURES AND MECHANICAL PARTS

4.2.2.4. *Doors closing and locking*

-> functional specifications like

- locking possible + against opening during running + status indicated
- instructions for use locking devices
- locking devices withstand the load and crossing trains
- using without additional tools except when available or motor driven systems

4.2.2.5. *Marking of freight wagons*

-> List and description of markings in an Annex in line with RIV- / GCU-markings

-> wagon number and 'TEN' marking handled in TSI OPE

-> new marking for wagon gauge

4.2.2.6. *Dangerous goods*

-> reference to directive 1996/49/EC and therefore to RID

-> reference to directive 1999/39/EC (transportable pressure equipment)

-> reference to EN 12972 (requirements for tanks)

TSI WAG significant contents

4.2.3. VEHICLE TRACK INTERACTION AND GAUGING

4.2.3. VEHICLE TRACK INTERACTION AND GAUGING

4.2.3.1. *Kinematic gauge*

-> specifications in an Annex coming from UIC leaflet 505-1

4.2.3.2. *Static axle load and linear load*

-> specifications coming from UIC leaflet 700, applicable up to 22.5 t axle load

4.2.3.3. *Rolling stock parameters which influence ground based train monitoring systems*

-> specifications for electrical resistance of wheelsets

-> hot axle box detection: open point, closed for cross authorised wagons with amended TSI including an ERA technical document generated from EN 15437; specification of a target area under an axle box in which a measurement is possible by a HABD

TSI WAG significant contents

4.2.3. VEHICLE TRACK INTERACTION AND GAUGING

4.2.3.4. *Vehicle dynamic behaviour*

- > specifications for *safety against derailment and running stability* coming from UIC 518 / EN 14363 (lateral track force Y and Y/Q forces) and TSI INF (vertical forces)
- > specifications for *Safety against derailment when running on twisted tracks* coming from UIC 518 / EN 14363 (Y/Q forces)

4.2.3.5. *Longitudinal compressive forces*

- > specifications in an Annex coming from UIC 530-2 (sustainable LCF)

TSI WAG significant contents

4.2.4. BRAKING

-> Specifications coming from several UIC leaflets and ISO 8573-1 concerning:

- general specifications (e. g. continuous automatic brake)
- braking performance (brake mass percentage)
- components:
 - slack adjuster
 - pneumatic half coupling
- energy storage (sufficient during emergency braking)
- energy limits (St. Gotthard's line as reference slope)
- wheel slide protection (if necessary)
- air-supply (ISO 8573-1)
- parking brake (numbers of parking brakes for different wagon types)

TSI WAG significant contents

4.2.5. COMMUNICATION

-> specifications coming from ISO 18000-6 type A if wagon is equipped with tags

4.2.6. ENVIRONMENTAL CONDITIONS

-> specifications for:

- altitude (2000 m)
- temperature (different classes)
- humidity
- rain, snow, ice, hail, solar radiation and pollution
- aerodynamic effects (open point, closed for cross authorised wagons as not related to compatibility to infrastructure)
- cross winds (open point, closed for cross authorised wagons without further specifications, operational measures could apply)

TSI WAG significant contents

4.2.7. SYSTEM PROTECTION

4.2.7.1. *Emergency Measures*

-> no specifications for freight wagons

4.2.7.2. *Fire safety*

-> specifications coming from several ENs and ISOs concerning:

- general (e. g. materials limiting generation, propagation of fire)
- normative references (ENs, ISOs)
- design rules (spark protection)
- material (ENs, ISOs, surface classifications, cables)

4.2.7.3. *Electrical protection*

-> specifications concerning:

- freight wagon bonding (electrical resistance to the rail, bonding connections)
- freight wagon electrical equipment bonding (protection against electric shocks)

TSI WAG significant contents

4.2.7.4. *Fixing of tail lamps*

-> specification coming from UIC 532 for tail signal lamp brackets with position, dimensions and clearances

4.2.7.5. *Provisions for the hydraulic/pneumatic equipment of freight wagons*

-> general specifications (no bursting, no inadvertently actuating, indicator for valve locking)

4.2.8. MAINTENANCE: MAINTENANCE FILE

-> specification for the content of a maintenance file:

- organic/functional description
- parts list
- limit values
- legal obligations (e. g. brake reservoirs)
- maintenance plan
- maintenance leaflets (e. g. tools, disassembly instructions)
- management of the file

TSI WAG significant contents

4.3. *FUNCTIONAL AND TECHNICAL SPECIFICATIONS OF THE INTERFACES*

-> specification of other TSIs are listed as references e. g.:

- TSI CCS -> specifications for maximum axle load, maximum inner axle distance, wheel geometric
- TSI OPE -> specifications for wagon number and 'TEN' marking
- dangerous goods -> reference to RID

4.4. *OPERATING RULES*

-> general specification for temperatures lower -25°

4.5. *MAINTENANCE RULES*

-> general specification for the party responsible for the management of the maintenance file

4.6. *PROFESSIONAL QUALIFICATIONS*

-> described in TSI OPE for operation and maintenance stuff

TSI WAG significant contents

4.7. HEALTH AND SAFETY CONDITIONS

-> no more specifications than in 4.6

4.8. INFRASTRUCTURE AND ROLLING STOCK REGISTERS

-> list of parameters the Infrastructure Register shall contain required by the wagon

-> list of parameters the Rolling Stock Register shall contain

Note: The registers are not for use in operation at the moment.

TSI WAG significant contents

5. INTEROPERABILITY CONSTITUENTS

5.1. DEFINITION

Interoperability constituents are “any elementary component, group of components, subassembly or complete assembly of equipment incorporated or intended to be incorporated into a subsystem upon which the interoperability of the trans-European conventional rail system depends directly or indirectly.

5.2. INNOVATIVE SOLUTIONS

-> specification and assessment methods are described in 6.1.2.3 and 6.2.2.2

5.3. LIST OF CONSTITUENTS

-> List of constituents defined as ICs

TSI WAG significant contents

5.4. CONSTITUENTS PERFORMANCES AND SPECIFICATIONS

5.4.1. STRUCTURES AND MECHANICAL PARTS

5.4.1.1. *Buffers +*

5.4.1.2. *Draw Gear*

-> reference to chapter 4

5.4.1.3. *Decals for Markings*

-> reference to chapter 4, Annex markings

5.4.2. VEHICLE TRACK INTERACTION AND GAUGING

5.4.2.1. *Bogie and Running Gear*

-> specifications concerning structure by referring to chapter 6, running gear listed in an Annex considered to meet the requirements (e. g. running gear from UIC 423 and more)

-> specification for operating through curves, on ramps and with access on ferry boats

TSI WAG significant contents

5.4.2. VEHICLE TRACK INTERACTION AND GAUGING

5.4.2.2. *Wheelsets* +

5.4.2.3. *Wheels* +

5.4.2.4. *Axles*

-> specification in Annex coming from ENs and UIC leaflets

TSI WAG significant contents

5.4.3. BRAKING

5.4.3.1. *Constituents approved at the time of publication of this TSI*

-> list of approved constituents in Annex coming from UIC homologations

5.4.3.2. *Distributor +*

5.4.3.3. *Relay valve for variable load/Automatic empty-load change over brake +*

5.4.3.4. *Wheel slide protection device +*

5.4.3.5. *Slack adjuster +*

5.4.3.6. *Brake cylinder/actuator +*

5.4.3.7. *Pneumatic half coupling +*

5.4.3.8. *End Cock +*

5.4.3.9. *Isolating device for distributor +*

5.4.3.10. *Brake pad +*

5.4.3.11. *Brake blocks +*

5.4.3.12. *Brake Pipe Emptying Accelerator valve +*

5.4.3.13. *Automatic load sensing & empty/load changeover device +*

-> specifications by referencing to chapter 4 and special Annexes coming from several UIC leaflets

TSI WAG significant contents

6. ASSESSMENT OF CONFORMITY AND/OR SUITABILITY FOR USE OF THE CONSTITUENTS AND VERIFICATION OF THE SUBSYSTEM

6.1. INTEROPERABILITY CONSTITUENTS

6.1.1. ASSESSMENT PROCEDURES

-> different assessment procedures (=modules) are given in an Annex with different obligation to use for new or 'conventional' ICs in different phases (design to production)

-> modules are e. g.:

- Internal production control
- Type examination
- Conformity to type
- Production quality management system
- Product verification
- Full quality management system
- Type examination by in service experience

TSI WAG significant contents

6.1.2.3. *Innovative solutions for Interoperability Constituents*

- > ERA finalise the appropriate functional and interface specifications of the constituents and develop the assessment methods
- > innovative solution may be used before being incorporated into the TSI

6.1.3. SPECIFICATION FOR ASSESSMENT OF ICS

6.1.3.1. *Structures and mechanical parts*

6.1.3.1.1. Buffers +

6.1.3.1.2. Draw Gear

- > reference to chapter 4

6.1.3.1.3. Marking of Freight Wagons

- > reference to chapter 4, Annex markings

6.1.3.2. *Vehicle track interaction and gauging*

6.1.3.2.1. Bogie and Running Gear

- > structure tests of body of bogies in an Annex coming from EN 13749 and UIC 510-3

TSI WAG significant contents

6.1.3.2.2. Wheelsets

6.1.3.2.3. Wheels

6.1.3.2.4. Axle

6.1.3.3. *Braking*

-> assessment is described in Annexes coming from ENs and UIC leaflets

TSI WAG significant contents

6.2. *SUBSYSTEM CONVENTIONAL RAIL ROLLING STOCK FREIGHT WAGONS*

6.2.1. ASSESSMENT PROCEDURES

-> different assessment procedures (=modules) are given in an Annex with different obligation to use

6.2.2.2. *Innovative solutions*

- > ERA finalise the appropriate functional and interface specifications of the constituents and develop the assessment methods
- > innovative solution may be used before being incorporated into the TSI

6.2.2.3. *Assessment of Maintenance*

-> The conformity assessment of maintenance is in the responsibility of each member state

TSI WAG significant contents

6.2.3. SPECIFICATIONS FOR ASSESSMENT OF THE SUBSYSTEM

6.2.3.1.1. Strength of main vehicle structure and Securing of Freight

-> assessment according to EN 12663 and buffing impact tests described in an annex coming from UIC B12/RP 17

6.2.3.2.1. Vehicle dynamic behaviour

-> When new wagons have to be approved by commissioning tests, these tests shall be done by:

- 1) measurement of wheel/rail forces or
- 2) measurement of accelerations or
- 3) validated modelling or
- 4) comparison with existing vehicles

The precise limit values will vary according to the testing and analysis method used.

TSI WAG significant contents

6.2.3.2.1.3. *Exemptions from dynamic behaviour test for wagons to built or converted to run up to 100km/h or 120km/h*

Freight wagons are permitted to run up to 100km/h or 120km/h without having to pass the dynamic behaviour test if they meet the following conditions defined in

— Longitudinal Compression Forces 4.2.3.5

— Static axle load, dynamic wheel load and linear load 4.2.3.2

and if they are fitted with a suspension or bogie listed in Annex Y for:

- Two axle wagons
- Wagons with two-axle bogies
- Wagons with three-axle bogies

6.2.3.2.1.4. *Exemptions from stationary tests*

Freight wagons are exempted from the stationary tests mentioned in section 4.2.3.4.2.1 if they comply with the requirements of UIC leaflet 530-2 (May 2006)'

6.2.3.2.2. Longitudinal compressive forces for freight wagons with side buffers
-> assessment in an Annex coming from UIC 530-2 (sustainable LCF)

TSI WAG significant contents

6.2.3.2.3. Measuring the freight wagons

-> measuring of underframes and bogies deviations from the nominal dimensions are within the permissible tolerances (EN 13775 part 1 to 3 and prEN 13775 parts 4 to 6).

6.2.3.3. *Braking*

6.2.3.3.1. Braking performance

-> assessments in an Annex coming from UIC leaflets

6.2.3.3.2. Minimum Brake System Testing

-> assessments coming from UIC leaflets

6.2.3.4. *Environmental conditions*

6.2.3.4.1. Temperature and other environmental conditions

-> for temperature tested in accordance with requirements given in section 4.2 and 6 and referenced European Standards

-> other environmental conditions: supplier to make a declaration of conformity stating how the environmental conditions have been taken into account in the design of the wagon

TSI WAG significant contents

7. IMPLEMENTATION

7.1. GENERAL

-> TSI WAG shall be implemented in close co-ordination with the Noise TSI

7.2. TSI REVISION

-> carried out by ERA

-> updated TSIs will be published on an indicative periodic basis of 3 years

-> innovative solutions shall be notified to ERA to introduce them in revised TSI

7.3. APPLICATION OF THIS TSI TO NEW ROLLING STOCK

Sections 2 to 6 and any specific provisions in paragraph 7.7 below apply in full to new freight wagons being placed into service, with the following exceptions:

— the provisions of section 4.2.4.1.2.2 (Braking Performance elements) deceleration profile in braking power, for which a date of implementation will be given in future revisions of the TSI.

This TSI does not apply to wagons being subject to a contract already signed or under final phase of tendering procedure before the date of entry into force of this TSI.

TSI WAG significant contents

7.4. *EXISTING ROLLING STOCK*

7.4.1. APPLICATION OF THIS TSI TO EXISTING ROLLING STOCK

-> TSI do not apply to existing wagons as long as not renewed or upgraded

7.4.2. UPGRADING AND RENEWAL OF EXISTING FREIGHT WAGONS

-> MS decide whether a modification is an upgrading or renewing (Dir. 2008/57/EC Art. 20)

-> if yes, wagon shall comply with TSI (7.4.2 of TSI), but

-> Member State shall decide to what extent the TSIs need to be applied to the project (Dir. 2008/57/EC Art. 20)

7.4.3. ADDITIONAL REQUIREMENTS FOR WAGON MARKING

-> all existing interoperable freight wagons are required to comply with the requirements of this TSI with respect to the design of wagon markings from the date of the next overall repainting of the wagon without the intervention of a notified body

TSI WAG significant contents

7.5. WAGONS OPERATING UNDER NATIONAL, BILATERAL, MULTILATERAL OR INTERNATIONAL AGREEMENTS

Member States shall notify the Commission, within 6 months after the entry into force of this TSI under which freight wagons related to the scope of this TSI:

Between Member States and Railway Undertakings or Infrastructure Managers or between Safety Authorities or more Member States and at least one third country due to the very specific or local nature of the intended transport service or which deliver significant levels of local or regional interoperability

The RIV Agreement and COTIF instruments shall not be notified.

TSI WAG significant contents

7.6 AUTHORISATION FOR PLACING IN SERVICE OF TSI CONFORM WAGONS

7.6.1 -> EC Declaration of Verification shall be mutually recognised by all Member States

7.6.2 -> Authorisation of placing in service of series possible

7.6.3 -> Authorisation for placing in service granted by one Member State shall be valid in all Member States unless additional authorisations are requested

-> “additional authorisation” procedure is the case of open points related to technical compatibility between infrastructure and vehicles -> listed in an Annex JJ

7.6.4 -> An authorisation of placing in service granted by one Member State shall be valid in all other Member States under the following conditions (= **cross authorisation**):

- compliant with TSI incl. solution for open points in Annex JJ.1.
- compatible with 1435 mm track gauge
- G1 wagon gauge
- inner axle distance max. 17.500 mm
- additional requirements from Annex JJ.2.

7.6.5. Even if a wagon has been authorised for placing in service, there is a need to ensure that it is operated on compatible infrastructures; this may be done through the use of Infrastructure and Rolling Stock registers.’

TSI WAG significant contents

Additional requirements of Annex JJ.2 (for cross authorised wagons):

1.1. *Hot Axle Box detection*

-> ERA technical document generated from EN 15437; specification of a target area under an axle box in which a measurement is possible by a HABD

1.2. *Cross winds*

-> no further specifications, operational measures could apply

1.3. *Assessment of welding joints*

-> EN 15085-5 of October 2007

1.4. *Assessment of maintenance*

-> maintenance file applied by a former registering RU member of RIV or approved in accordance with a national or international rule

1.5. *Wheel treads*

-> *in maintenance file*

TSI WAG significant contents

Additional requirements of Annex JJ.2 (for cross authorised wagons):

1.6. *Cast wheels*

-> not authorised pending the publication of a European standard

1.7. *Design and Assessment of composite brake blocks*

-> technical document which is published on the ERA website

2. Additional specifications for:

2.1. *Buffers and draw gears*

-> UIC and EN -> lifecycle test for draw gear

2.2. *Strength of main vehicle structure*

-> only validated numerical simulations are accepted

2.3. *Jacking*

-> free space from UIC leaflet

TSI WAG significant contents

2.4. *Axle*

-> EN 13103 section 7, EN 13260 section 3.2.2 and EN 13261 section 3.2.3

2.5. *Dynamic behaviour of the vehicle*

-> EN 14363 or leaflet UIC 432 apply if bogie not in Annex Y + alternative methods for safety against derailment when running on twisted tracks

2.6. *Longitudinal compressive force*

-> 3.2 of UIC 530-2 apply

2.7.1. *Energy storage*

-> UIC requirement concerning pressure after a brake application

2.8. *Two-axle wagons*

-> UIC 517 apply for suspension calculation

2.9. *Electric or electromagnetic interference*

-> UIC 550-2 and 550-3 when wagons fitted with a source of energy

TSI WAG significant contents

2.10. *Special types of wagons*

- > For wagons fitted with internal combustion engine: UIC leaflet 538;
- > For multiple and articulated wagons: UIC leaflet 572;
- > For wagons for the carriage of containers, swap bodies and horizontally loaded movable units: UIC leaflet 571-4;
- > For heat insulated and refrigerated wagons: UIC leaflet 554-2;
- > For semi trailers on bogies: UIC leaflet 597.

2.11. *Wagons coming to UK*

- > UIC leaflet 503

TSI WAG significant contents

2.6. *Longitudinal compressive force*

-> 3.2 of UIC 530-2 apply

2.7.1. *Energy storage*

-> UIC requirement concerning pressure after a brake application

2.8. *Two-axle wagons*

-> *UIC 517 apply for suspension calculation*

2.9. *Electric or electromagnetic interference*

-> UIC 550-2 and 550-3 when wagons fitted with a source of energy

2.10. *Special types of wagons*

TSI WAG significant contents

7.7. SPECIFIC CASES

- > *several specific cases = national rules are listed*
- > *wheel diameter related ranges for wheel geometry parameters for all countries*
- > *many coming from track gauge different from 1435 mm*

TSI WAG / Interoperability Directive

Problems in application

Problems in application

- *scope reduced on TEN network*
- *errors in TSI (e. g. handbrake performance based on cast iron brake blocks)*
- *use of existing spare parts when ICs (non-certified ICs not allowed in certified wagons)*
- *different behaviour concerning network access*
- *use in non EU-countries*
- *use of wagons compatible with cross authorised wagons (e. g. wagon gauge G2)*

TSI WAG Revision

Principles, Perspective

TSI WAG is under Revision, Principles, Perspective:

- Scope extension is mandated
- Less annexes and more references to ENs
- Core TSI with less requirements than current version (to be applicable for all types of wagons and different constructions from UIC) e.g:
 - UIC coupling not mandatory
 - UIC braking not mandatory
 - UIC steps and handrails not mandatory
 - UIC markings not mandatory
 - Gauges up to GC, G1 not mandatory
- Introduction of marking like 'RIV' with additional requirements = mandatory use of points above; marking is voluntary in application
 - > wagons shall be cross authorised
- Introduction of new marking for wagons compatible with 'RIV' wagons = mandatory use of some point above except items like gauge
 - > wagons can be operated in trains with RIV wagons but not on the complete network

Many thanks for your attention