

ENERGY

COMMISSION REGULATION (EU) NO 1301/2014
ENTRY INTO FORCE: 18/11/2014

WHAT DOES IT CONCERN TO?

This TSI concerns the energy subsystem and covers all fixed installations necessary to achieve interoperability that are required to supply traction energy to a train.

ESSENTIAL REQUIREMENTS

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

WHAT DOES IT CONTAIN?

- Introduction with the technical, risk, and geographical scopes
- Definitions of the subsystem and of the scope
- Essential requirements
- Characteristics of the subsystem, particularly the functional and technical specifications of the subsystem and of the interfaces
- Interoperability constituents
- Assessment of conformity and/or suitability for use of the constituents and verification of the subsystem
- Implementation

GEOGRAPHICAL SCOPE

It applies to high-speed lines, conventional lines (both passenger and freight) and all vehicles likely to travel all or part of the Union's network (locomotives and passenger rolling stock, freight wagons and special vehicles, such as on-track machines).

It does not apply to metros, trams and light rail vehicles, privately owned railway infrastructure, infrastructure and vehicles reserved for a strictly local, historical or touristic use.

TECHNICAL SCOPE

The ENE TSI concerns the energy subsystem and part of the maintenance subsystem of the Union rail system.

- Energy subsystem: The electrification system, including overhead lines and the trackside electricity consumption measuring and charging system.
- Maintenance subsystem: 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.

It shall **apply** to:

- any new, upgraded or renewed 'energy' subsystem of the rail system in the European Union.
- new railway lines in the European Union, which are placed in service from 1 January 2015.
-

It shall **not apply** to existing infrastructure of the rail system in the European Union, which is already placed in service on all or part of the network of any Member State on 1 January 2015, except when it is subject to renewal or upgrading.

FUNCTIONAL AND TECHNICAL SPECIFICATIONS OF THE ENERGY SUBSYSTEM

PARTICULAR CASES DEPENDING ON THE COUNTRY

They are divided in 'Permanent' and 'Temporary' cases.

Estonia, France, Italy, Latvia, Lithuania, Poland, Spain, Sweden, UK, Eurotunnel.

POWER SUPPLY

- Voltage and frequency
- Parameters relating to supply system performance
- Current capacity, DC systems, trains at standstill
- Regenerative braking
- Electrical protection coordination arrangements
- Harmonics and dynamic effects for AC traction power supply systems

GEOMETRY OF THE OCL AND QUALITY OF CURRENT COLLECTION

- Geometry of the overhead contact line (OCL)
- Pantograph gauge
- Mean contact force
- Dynamic behaviour and quality of current collection
- Pantograph spacing for overhead contact line design
- Contact wire material
- Phase separation sections
- System separation sections
- On-ground energy data collecting system (check point [4.2.8.2.8 of LOC & PAS TSI](#))
- Protective provisions against electric shock

What is a TSI? Is a document that defines the technical and operational standards which must be met by each subsystem or part of subsystem in order to meet the essential requirements and ensure the interoperability of the railway system of the European Union.

For each of those subsystems, the essential requirements need to be specified and the technical specifications determined, particularly in respect of constituents and interfaces, in order to meet those essential requirements. <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32016L0797&from=EN>

This document is for information purposes only, for official information go to https://www.era.europa.eu/activities/technical-specifications-interoperability_en

In case of doubt please contact tecsteam@eimrail.org

The content is copyright of EIM - ©EIM 2021. All rights reserved. Any redistribution or reproduction of part or all of the contents in any form is prohibited other than the following: you may copy the content to individual third parties, but only if you acknowledge the source (@EIM) as the source of the material. www.eimrail.org

OPERATING RULES

Operating rules are developed within the procedures described in the infrastructure manager safety management system. These rules take into account the documentation related to operation, which forms a part of the technical file, as required in Article 15 and as set out in Annex IV of Directive (EU) 2016/797.

In certain situations involving pre-planned works, it may be necessary to temporarily derogate from the specifications of the energy subsystem and its interoperability constituents.

MAINTENANCE RULES

Maintenance rules are developed within the procedures described in the infrastructure manager safety management system (SMS).

The maintenance file for ICs and subsystem elements shall be prepared before placing a subsystem into service as the part of the technical file accompanying the declaration of verification.

The maintenance plan shall be drawn up for the subsystem to ensure that the requirements set out in the ENE TSI are maintained during its lifetime.

IMPLEMENTATION EXISTING LINES

Upgrading/renewal of the OCL and/or the power supply

- It is possible to gradually modify all or part of the OCL and/or the power supply system – element by element – over an extended period of time to achieve compliance with the ENE TSI.
- The process of upgrading/renewal should take into consideration the need of maintaining compatibility with the existing energy subsystem and other subsystems. For a project including elements not being TSI compliant, the procedures for the assessment of conformity and EC verification to be applied should be agreed with the Member State.

Parameters related to maintenance

- While maintaining the energy subsystem, formal verifications and authorisations for placing into service are not required. However, maintenance replacements may be undertaken, as far as reasonably practicable, in accordance with the requirements of the ENE TSI contributing to the development of interoperability.

Route compatibility checks before the use of authorised vehicles

- The procedure to be applied and the parameters of the energy subsystem to be used by the railway undertaking, for the purpose of route compatibility check are described in point 4.2.2.5 and appendix D1 of the [Annex to Commission Implementing Regulation \(EU\) 2019/773](#).

NEW, RENEWED OR UPGRADED RAILWAY LINES

Implementation plan for voltage and frequency

- The choice of power supply system is a Member State's competence. The decision should be taken on economic and technical grounds, taking into account at least the following elements:
 - The existing power supply system in the Member State;
 - Any connection to railway line in neighbouring countries with an existing electrical power supply;
 - Power demand.
- New lines with speed greater than 250 km/h shall be supplied with one of the AC systems as defined in point 4.1.1.1.

Implementation plan for OCL geometry:

- Scope of the implementation plan: Member States' implementation plan shall take into account the following elements:
 - closing gaps between different OCL geometries;
 - any connection to the existing OCL geometries in neighbouring areas;
 - existing certified ICs OCL.
- Implementation rules for 1435 mm track gauge system: The OCL shall be designed taking into account the following rules:
 - New lines with speed greater than 250 km/h shall accommodate both pantographs as specified in the LOC & PAS TSI points 4.2.8.2.9.2.1 (1600 mm) and 4.2.8.2.9.2.2 (1 950 mm).
 - Renewed or upgraded lines with speed equal or greater than 250 km/h shall accommodate at least a pantograph with the head geometry specified in the LOC & PAS TSI point 4.2.8.2.9.2.1 (1600 mm).
 - Other cases: the OCL shall be designed for use by at least one of the pantographs with the head geometry specified in the LOC & PAS TSI points 4.2.8.2.9.2.1 (1600 mm) or 4.2.8.2.9.2.2 (1950 mm).
- Implementation rules for track gauge systems different than 1435 mm: The OCL shall be designed for use by at least one of the pantographs with the head geometry specified in the LOC & PAS TSI point 4.2.8.2.9.2.
- By 1 January 2022, Member States shall ensure that an on-ground energy data collecting system capable to exchange compiled energy billing data in accordance with point 4.1.2.9 of this Guide is implemented.

What is a TSI? Is a document that defines the technical and operational standards which must be met by each subsystem or part of subsystem in order to meet the essential requirements and ensure the interoperability of the railway system of the European Union.

For each of those subsystems, the essential requirements need to be specified and the technical specifications determined, particularly in respect of constituents and interfaces, in order to meet those essential requirements. <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32016L0797&from=EN>

This document is for information purposes only, for official information go to https://www.era.europa.eu/activities/technical-specifications-interoperability_en

In case of doubt please contact tecteam@eimrail.org

The content is copyright of EIM - ©EIM 2021. All rights reserved. Any redistribution or reproduction of part or all of the contents in any form is prohibited other than the following: you may copy the content to individual third parties, but only if you acknowledge the source (@EIM) as the source of the material. www.eimrail.org