Regulations on vehicles on the national railway network (vehicle regulations)

§ 1. Scope

The regulation includes authorisation to place in service, upgrading, renewal, operation and maintenance of the vehicle on the national railway network.

The provisions of section 8 to section 18 applies to vehicles that will be applied after the interconnection regulation chapter V.

§ 2. Purpose

The regulation sets out the minimum requirements for the technical specifications of the national vehicle. This in order to achieve safe and appropriate engineering, construction, authorisation to place in service, upgrading, renewal, operation and maintenance of the vehicle. The regulation will help to achieve at the national samtrafikkevne railway network by deploying criteria to make use of the vehicle.

§ 3. Definitions

Of the regulations here be understood with:

a) the national railway network: the railway network owned and maintained by the National Infrastructure Manager

b) railway companies: railway enterprises as defined in the distribution regulations, and any other public or private companies, if the business is to provide services for the transport of goods and/or passengers by rail, and which undertakes to ensure traction; This also applies to companies that only provide traction,

c) railway undertaking: business which operates freight and passenger transport, railway infrastructure and traffic management

d) train: traction vehicles, with or without carriages, which is given a train number in a route and to be run from a particular starting location to a specific arrival place,

e) shunt: vehicles that are moved under shunting

f) shunting: moving of vehicles on a drive or on a side track and, where appropriate, on the part of a main track that it is necessary to employ to perform switching on a side track,

g) vehicle: a railway vehicle that runs on its own wheels on railway, with or without their own traction. A vehicle is composed of one or more structural and functional subsystems or parts of such subsystems,
h) subsystem: the result of subsystems, the section of the rail system, as described in annex II to the Interoperability Directive. These part systems that it has to be determined basic requirements to is of structural or functional character,

h) essential requirements: All the conditions set out in annex III to the Interoperability Directives that must be met by the rail system, subsystems and interoperability constituents, including the interface,

i) technical specification for samtrafikkevne (TSI): a specification adopted in accordance with Directive 2008/57/EC and carried out in line with the EEA-agreement with the legal authority of the Interoperability Directive that each subsystem or part of a subsystem to be covered by to fulfill the basic requirements and ensure railway system’s interoperability,

j) TSI LOC & PAS: technical specifications for the interoperability for the subsystem "rolling stock"- locomotives and rolling stock for passenger traffic,

k) TSI WAG: technical specifications for the interoperability that apply to the subsystem "rolling stock"-goods wagons,

l) TSI noise: interoperability technical specifications that apply to the subsystem "rolling stock"-noise in the trans-European rail system for conventional trains,

m) TSI SRT: interoperability technical specifications regarding safety in railway tunnels,

n) TSI PRM: technical specifications for the interoperability regarding "people with limited mobility" in the trans-European rail system for conventional trains and high-speed trains,

o) TSI CCS: interoperability technical specifications for the subsystem "management, control, and signal",

p) basic parameters: any regulatory, technical or operational condition which is of vital importance for the interoperability, and which are specified in the relevant TSI or Appendix to this regulation,

q) specific case: any part of the railway system that requires temporary or permanent special provisions of the TSI and the EEA Agreement, because of geographical, topographical or urban environment restrictions, or for the sake of compatibility with the existing system.
r) upgrade: Any larger change work on a subsystem or part of a subsystem which improves the system overall performance,

s) authorisation to place in service: all operations where a subsystem or a vehicle is put in the intended use,

t) keeper: The person or entity who, as the owner of a vehicle or who have the right to use it, using the vehicle as a means of transport and is registered as the holder of the vehicle register set out in the Interoperability Directive § 32,

u) entity in charge of maintenance: an entity with responsibility for the maintenance of a vehicle, and registered as this in the national vehicle registry. Entity responsible for maintenance can be a railway undertaking, an infrastructure manager or a holder.

Requirements for railway enterprises

§ 4. Responsibility for safety

The railway undertaking is to ensure that the vehicles at any given time are in such a condition that it be added to facilitate the safe operation of the railway system. Vehicles to have a technical and operational condition that makes that business is within the acceptable risk.

Vehicle type should surely be integrated in the security management system. Line compatibility between vehicle and infrastructure should be considered and documented in the security management system.

§ 5. Technical documentation

The railway undertaking should have technical documentation that describes the assumptions and constraints that are attached to the vehicle's design. The documentation should be able to verify that the systems, parts and components are in accordance with the national and international standards that are assumed for the construction and use of the vehicle. These assumptions and the limitations to the conduct of procedures for the operation and maintenance of the vehicle.

The business that owns the vehicle is responsible for keeping up to date the maintenance documentation, including documentation and operational conditions of security importance to the material. The one who rent the material is obliged to follow the instructions in this documentation. Changes of operational requirements and maintenance documentation for rolling stock should be documented with risk analysis, risk assessment, and conditions for safe use.
The second paragraph does not apply to freight wagons.

§ 6. Register and tagging

The railway undertaking is going to have a record of all vehicles that the business user. The registry to identify vehicle individually. Requirements to register does not apply to vehicles used exclusively on the site.

The vehicle shall be registered in accordance with the requirements imposed by the regulation on the national vehicle registry of the national railway network. The holder is obliged to update the information contained in the Pan-European vehicle registry (ECVVR).

Vehicle should be selected according to the identity in the Interoperability Directive, as well as technical and marked in accordance with the TSI requirements.

Other and the third paragraph does not apply to vehicles mentioned in section 10 that should not be used as the train or shift.

§ 7. Operation, control and maintenance of vehicles

The railway undertaking is going to run and maintain the vehicles according to national and international standards.

The railway undertaking will take control of vehicles. The railway undertaking to identify the safety-critical systems, parts and components and fix safety minimum requirements for these.

The railway company should be responsible for the vehicle is maintained. The maintenance is to ensure that no security-critical systems, parts or components deteriorate so much that it leads to malfunction. Among other safety wear limits for wear exposed parts be specified, and the futures market for the maintenance and replacement of all safety-critical components should be specified. The railway undertaking shall have the control and document the maintenance performed.

If the one who rent vehicles see the need to make changes to the material for safety reasons, the changes must be clarified with the owner. By disagreement about the change, whether the change is of safety importance, the matter can be submitted to the Norwegian Railway Inspectorate for consideration of whether the vehicle meets regulation requirements.

The fourth paragraph does not apply to freight wagons.

Requirements for vehicles
§ 8. Criteria for permission to authorisation to place in service of the vehicle

To obtain permission to authorisation to place in service after the Interoperability Directive chapter V vehicle must meet the requirements of a relevant TSI and national technical requirements in the annex as long as a corresponding basic parameter is not described in the TSI. This does not apply to vehicles mentioned in section 10 that should not be used as train or shift.

§ 9. Use of standards

Vehicles shall be constructed, tested, plans and works proceed, upgraded and renewed according to relevant TSI and reputable, temporal standards. Where it is not provided otherwise in the regulations here, it is the latest version of the standard that applies.

For all new vehicles or by significant upgrades of vehicles to process default a 50126 followed.

Where a basic requirements can be met by the use of other standards than the one stated in the attachment the use of these standards must be considered technical and security issues, and the assessment should be documented.

Deviations from the standards to be considered technical and security issues, and the assessment should be documented.

§ 10. Requirements for certain categories of vehicles

Vehicle that is according to the standards a 14033, a, a, 15746 15954 a 15955 or are considered to meet the 13977 basic requirements. If such vehicle to be run as the train or shift, yet the demands of traction vehicle in the annex to the regulation to be met.

The permission process
§ 11. Permission to authorisation to place in service and changes of vehicles

Vehicle must have permission to authorisation to place in service according to the Interoperability Directive chapter V.

Before the vehicle referred to in section 10 is applied to the State's railway supervision to give permission to the authorisation to place in service in accordance with this regulation. For vehicles to run as the train or SHIFT does the first paragraph.

Permission to make use of the vehicle is provided by first-time authorisation to place in service in Norway.

By later changes and upgrading of vehicle is this going to happen according to § 18 of the Interoperability Directive. § 13 and § 14 applies to new permission to take changed vehicles in use.

§ 12. Permission to transport and test run on the national railway network

Transport or test run on the national railway network before the authorisation to place in service requires a separate permission from the Norwegian Railway Inspectorate. § 14 and section 15 applies to application for a permit under this section as far as appropriate.

It must be submitted a transport plan with risk assessments to the State's railway supervision in connection with the application for transport.

It must be submitted with the risk to the test plan reviews the State's railway supervision in connection with the application for permission to test run. The test plan should give the list of all the necessary and scheduled tests that are scheduled to show that the vehicle has the requisite safety and operational properties. The results from the tests will be sent to the Norwegian Railway Inspectorate. The link between the individual test and conducted risk assessments must be disclosed in the application.

§ 13. Notice of acquisition and change of vehicle

To send message about the plans to change or obtain a new vehicle or a vehicle that is in use in another EEA Member State at such an early stage as possible. This message should at least contain:

a) contact name,

b) planned progress in the procurement process,

c) description of the vehicle (system description),
d) plan of security activities to be implemented in connection with the acquisition (the security plan),

e) overview of TSIer and/or standards required in connection with the acquisition, and

f) risk assessments in accordance with the principles of the common security method that is used as a surface by assessment of the solution.

Message can be omitted in the following cases:

- In connection with the application for permission to authorisation to place in service of the vehicles mentioned in section 10 that should not be run as the train or shift

- In connection with the application for a permit under § 12

- In connection with the application for permission under § 16.

§ 14. Application for first permission to make use of vehicles and new permission after changing

By applications for permission after the Interoperability Directive § 20 and § 25 for the vehicle that does not have permission to authorisation to place in service, among other things, the following documentation shall be attached to the application:

a) EC declaration of verification, complete with documentation of the subsystems in the vehicle that is covered by TSI,

b) verification statement complete with documentation for compliance with the relevant national technical requirements (Appendix I)

d) safety assessment report confirming the safe integration of the vehicle’s relevant subsystems according to the common safety method for risk assessments,
e) safety assessment report confirming the safe integration between your vehicle and the Norwegian railway system in accordance to the common safety method for risk assessments.

§ 15. Application for further permission to make use of the vehicle

By applications for permission to authorisation to place in service in Norway of vehicles that already have permission from another EEA State, among other things, the following documentation shall be attached:

a) evidence that the vehicle has an authorisation to place in service in another EEA Member State, and any terms of this permission,

b) copy of the EC-declaration of verification, complete with documentation of the subsystems in the vehicle that is covered by TSI-is

c) verification statement complete with documentation for compliance with the relevant national technical requirements (Appendix I)

d) Verification statement carried out maintenance and modification history

e) safety assessment report confirming the safe integration between your vehicle and the Norwegian railway system in accordance to the common safety method for risk assessments.

§ 16. application for permission to use the vehicle in accordance with an allowed type

When applying for permission to authorisation to place in service of a vehicle that is in accordance with a vehicle type that already has permission to the authorisation to place in service in Norway, it is sufficient that a type of declaration according to the regulations on the type declaration be attached to the application.

If the prerequisites for providing the original permission has been changed, the steps in the Interoperability Directive § 28, third paragraph, be followed.

§ 17. Application to make use of certain categories of vehicles
When applying for authorisation to place in service of the vehicles mentioned in § 10, among other things, the following documentation is attached to the application:

a) contact name

b) description of the vehicle (system description)

c) overview of relevant standards that your vehicle is built, as well as any deviation from these standards

d) safety assessment report confirming the safe integration between your vehicle and the Norwegian railway system. If such vehicle to be run as the train or shift to safety assessment carried out according to the common safety method for risk assessment

e) the effectiveness of the standard referred to in § 10 and the relevant requirements in the annex to this regulation are met.

Unit with responsibility for the maintenance

§ 19. Unit with responsibility for the maintenance

Before the vehicle is used on the railway network, they shall have an assigned unit with responsibility for maintenance. This device shall be recorded in the vehicle register in accordance with the Interoperability Directive Article 32 second paragraph.

§ 20. Tasks for the unit with responsibility for the maintenance
Unit in charge of maintenance shall ensure that the vehicle maintains a safe operating state by means of a maintenance system. The vehicles to be maintained according to the maintenance documentation for each vehicle and the current requirements of the vehicle as follows of the Interoperability Directive and the regulation here, including requirements for maintenance in § 7.

Designation of the unit with responsibility for maintenance do not affect the railway corporate responsibility for the safe use of vehicles according to §§ 4, 7 and the general railway legislation.

Unit with responsibility for maintenance can even perform the maintenance, or use maintenance workshops according to the agreement.

Closing provisions

§ 21. Exceptions

Norwegian railway supervision can in particular cases make exceptions from the requirements of the regulations here, including the attachment. Exceptions from the requirements of the TSI-one can only be provided to the extent that it follows from the Interoperability Directive Article 8.

Norwegian railway supervision can provide exceptions from the requirements to identify the entity in charge of maintenance for the veteran or the Museum vehicles that runs through the national railway network, as long as these vehicles are according to the railway legislation by the way. Such exceptions may be granted for up to five years at a time.

The exception that is mentioned in the second paragraph may be granted in connection with registration of the vehicle after the Interoperability Directive § 32 or by the issuance of the safety certificate to the railway undertaking or infrastructure manager safety authentication after the railway regulation Chapter 6 or 7.

The exception after the second paragraph should be mentioned and justified in the annual safety report as the State's railway supervision to prepare after the railway regulation § 9-3 the second paragraph. If it turns out that there is a disproportionate safety risk on the railway system to the European Railway Agency immediately inform the European Commission and the EFTA surveillance authority. The EFTA surveillance authority to take contact with the parties involved and, where this is appropriate, ask the State's railway supervision to do about the exception.
§ 22. Entry into force and the change in other regulations

The regulation will take effect xx.xx.xx. From the same date in the following changes are made in other regulations:

Regulations on the national technical requirements and more for the railway infrastructure on the national railway network (rail infrastructure regulations) chapter IV. Special provisions on STM device is released.

The exception that is provided with the legal authority of the regulations 19. December 2005 Nr. 1621 on the requirements to the railway undertaking on the national railway network (safety regulations) apply to further as far as the exception.

Attachment

National technical vehicle requirements in connection with the authorisation to place in service

When the parameter list in the annex refers to the TSI-requirements apply these as national technical requirements. Designated authority verifies the compliance with the requirements in the annex.

AUTHORISATION TO PLACE IN SERVICE

Where the national technical rule matches a specific TSI point, referred to the respective TSI point. In these cases, be considered independent or TSI requirement along with standards and norms as originally assumed for the engineering and construction of the vehicle.

When the national rule, in whole or in part, are expressed by TSI requirements is the designated agency to verify DeBo compliance with the national technical rule.

1 Documentation (Documentation)

This chapter applies to all vehicles

1.1 General documentation (General documentation)

It should be prepared technical documentation for all systems, parts, components, and interfaces. The documentation should be able to verify that the systems, parts, components, and interfaces are in accordance with the TSI and standards that are assumed for the engineering and construction of the vehicle. The documentation shall describe the assumptions and constraints that are attached to the vehicle's design. Older vehicles will have an updated risk assessment, based on
the experience of previous operations and maintenance. For lifting plan and tow demands in the work of the TSI LOC & PAS point 4.2.12.5 accordingly.

1.2 Maintenance instructions and requirements

1.2.1 Maintenance instructions

It should be prepared documentation that describes how systems, parts and components will be maintained in accordance with the national and international standards that are added to the reason for the vehicle. Maintenance documentation to make sure that no safety-critical systems, components, or parts deteriorate to the extent that it leads to malfunction. Wear limits should be specified for components that are subject to wear. Intervals for maintenance and replacement must be specified for all components. The records that show the maintenance, if any verification after the derailment, and changes of the vehicle should be able to put forward. TSI LOC & PAS point applies 4.2.12.3.

1.2.2 The maintenance design justification file

It should be released documentation that justifies the maintenance instructions and requirements, such as maintenance intervals. TSI LOC & PAS point 4.2.12.3.1 also applies.

For freight vehicles WAG TSI point 4.5.2 applies accordingly.

1.3 Instructions and documentation for operation

1.3.1 Instructions for operation in normal and degraded modes of the vehicle

It should be released documentation for the vehicle's different functions during normal operation and use with impaired functionality including emergency situations, evacuation, salvage and towing. The documentation shall be in a language the user contains.

1.4 National requirement for testing

Documentation referred to in § 12 of the regulations here are going to be released.

It should further be released evidence that the vehicle is tested at the track so that it can withstand the operational and environmental loads it is exposed to during operation, including the derailment safety, satisfying run properties within the speed class materials is intended for and the brake effect. Interface with the infrastructure and secure integration on the railway network should be verified and documented. The tests and implemented risk assessment depending on the risk and scope in several steps, first on the test and eventually secured the draw then in mixed traffic; tests to validate the among other things, CCS functionality, communications, power supply, train detection, noise, dynamic properties, etc. For vehicles intended for the axle load higher than 25 tons, it must be carried out their own tests, risk assessments, calculations and verifications.

The following standard should be followed: EN 50215.

2 Structure and mechanical parts

This chapter applies to all vehicles.

2.1 Vehicle structure

2.1.1 Strength and integrity
The vehicle must have a mechanical strength and integrity that make that it can withstand the forces it is subjected to in all expected operating situations through the calculated lifetime. The requirements of the TSI LOC & PAS point 4.2.2.4 applies accordingly. For freight vehicles WAG TSI point 4.2.2.2 and 4.2.2.3 applies accordingly.

For OTM is the additional requirements described in the TSI LOC & PAS Attachments C, point c. 1. For vehicles with axle load higher than 25 tons, it must be carried out their own risk assessments, calculations and verifications.

Accepted standards should be added because, among other things: EN 12663, UIC 566, UIC 660, UIC 617, UIC 625, UIC 651, ERRI B 12 RP 17, ERRI B 12 RP 60 and ERRI B 12 DT 135.

2.1.2 Load capability

2.1.2.1 Load conditions and weighted mass
The requirements of the TSI LOC & PAS point applies 4.2.2.10.

For goods wagons applies the requirements of TSI WAG points 4.2.3.2. For the calculation of load capacity in the case of vehicles with axle load higher than 25 tons, it must be carried out their own risk assessments, calculations and verifications.

Accepted standards shall be applied, for instance: UIC 700, EN 50215, EN 15528 and EN 15663.

2.1.2.2 Axle load and wheel load
The requirements of the TSI LOC & PAS 4.2.3.2 applies accordingly. For goods wagons applies the requirements of TSI WAG points 4.2.3.2 accordingly. Wheel load difference higher than 5% is basically not allowed. For values higher than 5% must appropriate verifications for derailment safety and operational constraints considered in each case. For vehicles with higher axle load than 25 tons of it must be carried out their own risk assessments, calculations and verifications.

Accepted standards shall be applied, for instance: EN 15663, EN 50215, EN 13260, EN 15528, EN 13103, EN 14363, EN 13104, UIC 700 og UIC 518.

2.1.3 Joining technology
By the use of various parts or products to join comes to the vendors' declarations for parts or products' scope. Underlying documentation on the strength, calculations, spent standards and safety margins have to be a part of such statements.

In the calculation of strength and safety factors for some the join methods to accepted standards be added to because, among other things: EN 15085, UIC 897, EN 12663 and UIC 566.

2.1.4 Lifting and jacking
The requirements of the TSI LOC & PAS point 4.2.2.6 applies accordingly. For boxcars comes to WAG TSI point 4.2.2.2 accordingly. For OTM is the additional requirements described in the TSI LOC and PAS, attachment C, point c. 2.

When calculating the strength to accepted standards be added to because, among other things: UIC 581, UIC 566, EN 15877 and EN 12663.

2.1.5 Fixing of devices to car body structure
The requirements of the TSI LOC & PAS point applies 4.2.2.7. For OTM is the additional requirements described in the TSI LOC and PAS, attachment C, point c. 1.

When calculating the strength to accepted standards be added to because, among other things: UIC 566 and 12663.

2.1.6 Connections used between different parts of the vehicle

Connections used between different parts of the vehicle. Connections between different parts of the vehicle, for example, between cart Crate and suspension, to withstand the static and dynamic loads subjected to. The requirements of the TSI LOC & PAS 4.2.3.5.1 a similar point applies.

For boxcars comes to WAG TSI point 4.2.3.6.1 accordingly. For vehicles with axle load higher than 25 tons, it must be carried out their own risk assessments, calculations and verifications.

By load cases and the calculation of strength to accepted standards be added to because, among other things: EN 12663, EN 13 749, UIC 577, ERRI B12/RP17, UIC 515-1 and UIC 615-1.

2.2 Couplers/coupling systems

2.2.1 Automatic coupling

The requirements of the TSI LOC & PAS point 4.2.2.2.3 and 5.3.1 applies accordingly.

2.2.2 Characteristics of rescue coupling the requirements of the TSI LOC & PAS point 4.2.2.2.4, 4.2.2.2.5 and 5.3.3 applies accordingly.

Accepted standards should be added because, among other things: UIC 520, EN 15020.

2.2.3 Conventional screw coupling and other non-automatic coupling systems

The requirements of the TSI LOC & PAS point 4.2.2.2.2, 4.2.2.2.3 and 5.3.2 applies accordingly.

Accepted standards should be added because, among other things: UIC 826, UIC 520, ERRI B12 RP17 ERRI B36 RP32, UIC 526-3, EN 15566EN 15551, UIC 527, UIC 528, UIC 526, and UIC 825.

2.2.4 Buffing

The requirements of the TSI LOC & PAS point 4.2.2.2.3, 4.2.2.3, and 4.2.. 2.10 and the requirements of the TSI WAG point 4.2.2.1 apply accordingly.

Accepted standards should be added because, among other things: EN 15551, EN 15566, ERRI B12/DT 85, UIC 527, UIC 528 and UIC 526. On selection of buffers are accepted the following standards: UIC 527, UIC 528, UIC 526 og UIC 520.

2.2.5 Gangways

The requirements of the TSI LOC & PAS point 4.2.2.3 applies accordingly.

Accepted standards should be added because, among other things: EN 16286, EN 12561, UIC 561, UIC 527, UIC 528 and UIC 520.

2.3 Passive safety

The requirements of the TSI LOC & PAS point 4.2.2.5 applies to newer vehicles.
Accepted standards should be added because, among other things: EN 15227 and UIC 566. Requirements for rail guard: traction vehicles must have rail guard to protect the wheel against the foreign object. Rail guard is dimensioned to withstand the need for static forces in the direction of travel of at least 20 kN without permanent deformation. This can be verified by calculations. For the requirements of the TSI LOC & PAS point 4.2.3.5. and 4.2.3.7 accordingly. It must be taken into account and suspension wheels on the vehicle wear and tear when the rail clearing should be designed and calculated. Traction vehicle must have snowplows, where it can be expected snow.

Rail guard according TSI LOC & PAS point 4.2.2.5 and 4.2.6.1.2 can be replaced by snowplows as long as it does not conflict with the vehicle’s static and dynamic profile and safeguards the function to protect the wheel against the foreign object.

The requirements of the TSI LOC & PAS 4.2.6.1.2 and 4.2.2.5 applies accordingly.

3 Track interaction and gauging

The requirements of this chapter apply to all vehicles.

3.1 Vehicle gauge

The vehicle’s static and dynamic profile should be in accordance with the route show the profiles as stated by the infrastructure manager’s Web Guide. Vehicle that is according to the profile can be used on the entire NO1 the national railway network. Accepted standards should be added because, among other things: UIC 505, UIC 506, EN 15273

3.2 Vehicle dynamics

3.2.1 Running safety and dynamics

Vehicle must have satisfactory run safety. The vehicle’s run properties must be tested to determine the dynamic loading and interaction on track.

For the calculation and testing of the vehicle's safety and derailment run properties to the methods in a 14363 or UIC 518 followed. For working machines (OTM) is the additional requirements described in the TSI LOC & PAS Attachments C, point C3. Relevant limit values related to the track's properties are set by the infrastructure manager. For vehicles with axle load higher than 25 tons, it must be carried out their own risk assessments, calculations and verifications.

Under dynamic testing to track the strain and stress on safety relevant vehicle components are recorded for assessment of load, derailment hazards, sizing, as well as validation of calculations.

Older vehicles that have not been produced after a recognized safety controlled process, to have a risk assessment according to the common safety method based on experience that demonstrates safe operation on corresponding demanding infrastructure. The risk assessment should identify any usage limitations for the vehicle so that the risk is reduced to an acceptable level. By lack of experience data and satisfactory risk assessment requirements will in the third part of this point shall apply accordingly.

For the requirements of the TSI LOC & PAS 4.2.3.4. accordingly. For boxcars comes to WAG TSI point 4.2.3.5 accordingly.

Accepted standards should be added because, among other things: EN 14363, EN 15686, UIC 530-2, UIC 510, UIC 432, UIC 518, and UIC 645.
### 3.2.2 Equivalent conicity

The requirements of the TSI LOC & PAS 4.2.3.4.3 applies.

In addition, the following requirements apply:

Where it has been made tests of dynamic run properties, and found a stable area for equivalent conicity, is this going to be specified in the documentation for point 1.4.

Wheels are going to result in stable run. Measurements and processing of the measuring values should happen according to the rules in the UIC 518 or 14363. Wheels shall be in accordance profile to UIC 510-2. Accepted wheel profile for widely use is S1002. Based on testing and safety assessments can other wheel profiles are accepted. Coordinate tables and drawings for rail profiles provided by the infrastructure manager. The size of groove in the wheel tread should not be more than 2 mm. Maximum wheel spot and material outcomes is 60 mm for wheels with a diameter at or above the 920 mm, and 40 mm front wheel with smaller diameter.

Accepted standards should be added because, among other things: EN 15302:2008, EN 13715:2006, EN 13674-1:2003, EN 14363, UIC 518, UIC 519 and UIC 510.

### 3.2.3 Wheel profile and limits

Wheels are going to result in stable run. Measurements and processing of the measuring values should happen according to the rules in the UIC 518 or 14363. Wheels shall be in accordance profile to UIC 510-2. Accepted wheel profile for widely use is S1002. Based on testing and safety assessments can other wheel profiles are accepted. Coordinate tables and drawings for rail profiles provided by the infrastructure manager. The size of the groove in the wheel tread should not be more than 2 mm. Maximum hammer blow and material outcomes is 60 mm for wheels with a diameter at or above the 920 mm, and 40 mm front wheel with smaller diameter.

Accepted standards should be added because, among other things: EN 15302:2008, EN 13715:2006, EN 13674-1:2003, EN 14363, UIC 518, UIC 519 and UIC 510.

### 3.2.4 Track loading compatibility parameters

Vehicles must not result in greater than the track load values given by the infrastructure manager to ensure compatibility between the vehicle and the track. The requirements in section 3.2.1 also applies to the testing of the track load. The requirements of the TSI LOC & PAS point 4.2.3.4.2.2 also applies. For goods wagons applies the requirements of TSI WAG point 4.2.3.5 accordingly. For vehicles with axle load higher than 25 tons, it must be carried out their own risk assessments, calculations and verifications.

Accepted standards should be added because, among other things: : EN 15528, EN 14363, UIC 615 og EN 13749.

Vertical acceleration, self-resonant frequency and dynamic load for bridges shall not exceed bridges carrying capacity. Limits are set by the infrastructure manager.

It is to be conducted measurements of dynamic load under different operating conditions or change analysis based on a reference vehicle through the use of simulations or calculations. Conditions that must be examined is. the mass and inertia of the cart crate, bogies and wheel set, the vehicle's suspension characteristics and distribution of the load.
For the requirements of the TSI LOC & PAS point 4.2.3.4.2.2 accordingly. For boxcars comes to WAG TSI point 4.2.3.5 accordingly. For goods wagons with higher axle load than 25 tons of it must be carried out their own risk assessments, calculations and verifications.

Test the conditions in point 3.2.1 in the annex also applies here.

3.2.5 Minimum horizontal curve radius, vertical concave curve radius, convex curve radius

The requirement of the TSI LOC & PAS point applies 4.2.3.6. Minimum turning radius, vertical, horizontal, or in turnouts, emerges from the infrastructure manager's Web Guide.

3.3 Bogies/running gear

3.3.1 Bogies

Bogies including attachable equipment sizing according to recognized standards with sufficient safety margin, based on the requirements and test conditions in point 3.2.1 in the attachment here. This also applies to the connection between the bog gives frame and cart checkout. For vehicles with axle load higher than 25 tons, it must be carried out their own risk assessments, calculations and verifications.

The requirements of the TSI LOC & PAS point 4.2.3.5.1 also applies. For goods wagons applies the requirement in the WAG TSI point 4.2.3.6 accordingly.

Accepted standards should be added because, among other things: UIC 515-4, UIC 615-4, EN13749, EN 15687 and EN 15827.

3.3.2 Wheelset (complete)

Wheel sets sizing according to recognized standards with sufficient safety margin. Wheel sets to withstand the rigors they are exposed to, including additional stresses caused among others by torsional forces, friction between rail and wheel, foreseeable irregularities in the interface shine/wheels, etc.

The requirements of the TSI LOC & PAS point 4.2.3.5.2 also applies. For goods wagons applies the requirement in the WAG TSI point 4.2.3.6 accordingly. For vehicles with axle load higher than 25 tons, it must be carried out their own risk assessments, calculations and verifications.

Accepted standards should be added because, among other things: EN 13260, EN 13103, EN 13104, EN 13261, EN 13715, EN 13749, EN 13979, UIC 510-3, UIC 515-4 and UIC 615-4.

3.3.3 Wheel

Wheel sizing and be designed to ensure the safe driving on the railway network.

The wheels should be dimensioned with sufficient safety margin. Wheels should withstand the rigors they are exposed to, including additional stresses caused among others by torsional forces, friction between rail and wheel, foreseeable irregularities in the interface shine/wheels, etc.

The requirements of the TSI LOC & PAS point 4.2.3.5.2.2 also applies. For goods wagons applies the requirement in the WAG TSI point 4.2.3.6 accordingly. Front wheel of a different type than forged, rolled steel wheel in addition, it must appear that the requirements related to the thermal capacity when braking in point 4.5.3 of this annex are met. For vehicles with axle load higher than 25 tons, it must be carried out their own risk assessments, calculations and verifications.
Accepted standards should be added because, among other things: EN 13715, EN 13262, EN 13715, EN 13979-1, UIC 510, UIC 518-2, UIC 519, UIC 810, and UIC 812.

3.3.4 Wheel/rail interaction influencing systems

Equipment for lubrication and sand can be mounted according to the relevant standards, and so that it does not come in conflict with profile. Wheel/rail interface, geometric properties, wear and tear and interaction should be within the specific acceptance criteria so that the vehicle performed with sufficient run safety. It must be taken into account foreseeable irregularities in the interface rail wheels, etc. It must be taken into account usage from brake pads, sand and/or flange lubricant that may prevent safe detection of the train on the track.

For the geometric properties of the wheels comes to the requirements of the TSI LOC & PAS point 4.2.3.5.2.2 accordingly. For compatibility with train detection systems applies to the requirements of the TSI LOC & PAS point 4.2.3.3.1.1 accordingly.

Accepted standards should be added because, among other things: EN 15427, EN 12080, EN 13715, EN 12081, EN 12082, EN 50238, UIC 612, UIC 737.

3.3.5 Sand system

Equipment for lubrication and sand can be mounted according to the relevant standards, and so that it does not come in conflict with profile or affect negatively the wheel-rail contact area. It must be taken into account usage from sand and/or flange lubricant that may prevent safe detection of the train on the track. When mounting the equipment for lubrication and sand to climatic winter conditions be taken into account. shielding, insulation, heating, etc.

3.3.6 Bearings on the wheel set

Vehicles to have wheel set bearing that are sized for the intended use. Axle box should be designed and dimensioned so that all the foreseeable stresses and fatigue according to the lifetime of the components are taken into account with sufficient safety margin. For monitoring the shaft bearings and axle box condition applies to the requirements of the TSI LOC and PAS and WAG TSI 4.2.3.3.2 4.3.2.6.5 accordingly. See also point in this attachment 3.3.8.

Accepted standards should be added because, among other things: EN 12082, EN 12081, EN 12080, EN 15437, UIC 515, UIC 615 and UIC 510.

3.3.7 Axle shaft

See also, point 3.3.2 of this annex. The WAG TSI point 4.2.3.6.4 and 6.1.2.4 and TSI LOC & PAS point and applies 4.2.3.5.2.1 6.2.3.7. Axles should be surface protected against external stresses. Shafts shall have the identification marking and labelling control.

3.3.8 Axle bearing condition monitoring

For monitoring the shaft bearings and axle box condition applies to the requirements of the TSI LOC and PAS and WAG TSI 4.2.3.3.2 4.3.2.6.5 accordingly. See also, point 3.3.6 in this attachment.

3.4 Limit of maximum longitudinal positive and negative acceleration

The requirements of the TSI LOC & PAS point 4.2.4.5.1 last paragraph apply accordingly. Energy absorbing elements should be taken into account when calculating the deceleration encountered, for example, extraordinary change, etc.
Accepted standards should be added because, among other things: UIC 566 and EN 12663.

4 Braking

The requirements of this chapter apply to all vehicles as long as nothing else is specified.

4.1 Functional requirements for braking the train level

All vehicles to have brakes. The brakes should under all conditions could help to stop a train within a maximum slowing the length defined by the infrastructure manager of the individual segments of the route the vehicle to operate. Brake systems should be designed so that they fail to secure state. The brake system to function automatically and continuously, and not be fatigued during normal operation.

Passenger carriages, locomotives and train sets will be equipped with the emergency brake, the operating brake and parking brake.

The requirements of the TSI LOC & PAS points 4.2.4.1 and applies 4.2.4.2.1. The requirements of the TSI WAG points 4.2.4.1 and applies the requirements of 4.2.4.3 TSI ONE point 4.2.6 also applies as far as appropriate. The brake system must work satisfactorily with the stretch show restrictions for backfeed of energy to the catenary which emerges from the infrastructure manager’s Web Guide

Accepted standards should be added because, among other things: the UIC series 540-549.

4.2 Safety requirements for braking the train level

4.2.1 Reliability of main brake system functionality

The requirements of the WAG TSI point and 4.2.4.2 and TSI LOC & PAS point 4.2.1.3 and 4.2.4.2.2 are for the corresponding.

4.2.2 Reliability of traction/braking interlocking

The requirements of the TSI LOC & PAS point, and point 4.2.4.4.1, 4.2.4.4.2, and 4.2.4.7 also applies as far as appropriate. See in addition point 4.4.1 in this attachment.

4.2.3 Reliability of stopping distance

The requirements of the TSI LOC & PAS point 4.2.4.4.2, 4.2.4.4.1 also applies as far as appropriate.

4.2.4 Reliability of parking brake

The requirements of the TSI LOC & PAS point 4.2.4.4.2, 4.2.4.4.5 also applies as far as appropriate.

4.3 Brake system—Recognised architecture and associated standards

The requirements of the TSI LOC & PAS point 4.2.4.3 and WAG TSI applies 4.2.4.2. By the use of other than UIC-based brake system, it must be done their own risk assessments of the brake system’s suitability and safety.
4.4 Brake command

4.4.1 Emergency braking command

All traction vehicles should have the emergency brake. Person to have train vehicle emergency-stop device which can be operated from any wagons in the train. On newer vehicles to be able to postpone activation causes the emergency brake. The repeal of the emergency brake after the vehicle has stopped has to happen by the execution of an active action. See the point in this otherwise 10.2.3 attachment.

The requirements of the TSI LOC & PAS point 4.2.4.4.1 also applies as far as appropriate.

Accepted standards should be added because, among other things: the series UIC 540-549, UIC 612.

4.4.2 Service braking command

The requirements of the TSI LOC & PAS point 4.2.4.4.2 and 4.2.4.3.2.1. applies accordingly.

Accepted standards should be added because, among other things: the series UIC 540-549, EN 14531.

4.4.3 Direct braking command

The requirements of the TSI LOC & PAS point 4.2.4.4.3 also applies.

Accepted standards should be added because, among other things: the series UIC 540-549.

4.4.4 Dynamic braking command

The requirements of the TSI LOC & PAS point 4.2.4.4.4, and 4.2.4.7 applies.

Accepted standards should be added because, among other things: the series UIC 540-549.

4.4.5 Parking braking command

The requirements of the TSI LOC & PAS point 4.2.4.4.5 and WAG TSI 4.2.4.3.2.2 applies.

Accepted standards should be added because, among other things: the series UIC 540-549.

4.5 Brake performance

4.5.1 Emergency braking performance

The requirements of the TSI LOC & PAS point applies 4.2.4.5.2. For vehicles with axle load higher than 25 tons, it must be carried out their own risk assessments, calculations and verifications.

Accepted standards should be added because, among other things: the series UIC 540-549.

4.5.2 Service braking performance

The requirements of the TSI LOC & PAS point 4.2.4.5.3 and WAG TSI 4.2.4.3.2.1 applies. For vehicles with axle load higher than 25 tons, it must be carried out their own risk assessments, calculations and verifications.

Accepted standards should be added because, among other things: the series UIC 540-549.
4.5.3 Calculations related to thermal capacity

The principles of the TSI LOC & PAS point 4.2.4.5.4 and 4.2.3.5.2.2, and TSI WAG point 4.2.4.3.3 applies, but with a speed of 80 km/h to be able to be kept in a sleep slope with 2.2% inclination of 75 km. The thermal capacity should be disclosed in the documentation; allowed speed in sleep slope should be in relation to the stated thermal capacity. For vehicles with axle load higher than 25 tons, it must be carried out their own risk assessments, calculations and verifications.

Accepted standards should be added because, among other things: the series UIC 540-549.

4.5.4 Parking brake performance

All vehicles shall have the parking brake or other equipment for secure parking and stabling. The parking brake should be dimensioned so that it can keep the vehicle with maximum load certainly fixed until the deliberately released. In addition, other appropriate ways to ensure that the vehicle is not in motion comes on can be used.

For the requirements of the TSI LOC & PAS point 4.2.4.5.5 and TSI WAG 4.2.4.3.2.2 accordingly.

Accepted standards should be added because, among other things: the series UIC 540-549.

4.5.5 Brake performance calculation

When calculating the brake effect and brake control features to be taken into account for the lower friction coefficients. difficult climatic conditions. The requirements that apply to difficult snow-, ice- and hail conditions in TSI LOC & PAS point 4.2.6.1.2 should be added to reason for any vehicle to operate without restrictions on the national railway network.

4.6 Braking adhesion management

4.6.1 Limit of wheel rail adhesion profile

The requirements of the TSI LOC & PAS point 4.2.4.6.1 also applies. When calculating the brake effect and design of the brake system to reduced brake effect and lower friction values because of the geographic and climatic conditions shall be taken into account.

Accepted standards should be added because, among other things: UIC UIC 544 and 546.

4.6.2 Wheel slide protection system

The requirements of the TSI LOC & PAS point 4.2.4.6.2 also applies. For goods wagons applies the requirements of TSI WAG point 4.2.4.1.2.6 accordingly. When calculating the brake effect as well as the design and adjustment of the sliding protection system to lower friction values because of the climatic conditions shall be taken into account.

Accepted standards should be added because, among other things: UIC 541 and EN 15595.

4.7 Braking force production

4.7.1 Friction brake components

4.7.1.1 Brake blocks

Composite materials in brake pads need to be documented to work satisfactorily under all foreseeable climatic conditions, especially under difficult conditions as described in the TSI LOC &
PAS point 4.2.6.1.2, and make sure to provide sufficient braking. Such materials shall in addition be approved according to UIC 541-4. For that vehicle to be able to be used without operational restrictions, it must have been conducted testing that ensures that the requirements to be followed in the operation.

4.7.1.2 Brake discs

Material quality in the brake discs must be documented to be adapted to the corresponding friction materials so that it be achieved satisfactory under all foreseeable brake effect operational conditions, including climatic conditions. Accepted standards should be added because, among other things: EN 14535

4.7.1.3 Brake pads

The use of composite materials in brake linings must meet similar requirements as in paragraph 4.7.1.1.

4.7.2 Dynamic brake linked two traction

The requirements of the TSI LOC & PAS point 4.2.4.7 applies.

4.7.3 Magnetic track brake

The requirements of the TSI LOC & PAS point 4.2.4.8.2 applies.

4.7.4 Eddy current track brake

Eddy current brake can interfere with the signal systems, and other electrical systems. It must therefore be considered in each case about eddy current brake can be used so that the requirement of technical compatibility are met. That’s when the requirements for a complete risk assessment and validation by test run on the railway network.

4.7.5 Parking brake

The requirements of the TSI LOC & PAS 4.2.4.5.5 applies. See the point in this otherwise 4.5.4 attachment.

4.8 Brake state and fault indication

The requirements of the TSI LOC & PAS point 4.2.4.9 and WAG TSI point 4.2.4.3.2.2 applies.

The following standard accepted: UIC 547. By the use of other than UIC-based brake system, it must be done their own risk assessments of the brake system's suitability and safety.

4.9 Brake requirements for rescue purposes

The requirements of the TSI LOC & PAS point 4.2.4.10 applies. The requirements also apply to vehicles that will go into train formations under 200 tons.

5 Passenger-related items

5.1 Access
5.1.1 Exterior doors

Exterior doors should be designed and operated so that the safety of passengers and personnel. When closing the doors are going to be able to detect whether passengers or personnel will be jammed, and automatically stop and released for a limited time. The doors and related equipment to withstand the forces that they are exposed to while driving.

The requirements of the TSI LOC & PAS point 4.2.5.5 and 4.2.5.6 applies as far as appropriate. Point 4.2.5.5.3 to 4.2.5.5.10 include safety requirements and also applies as far as appropriate. Only functional requirements that are relevant to the vehicle should be taken into account. Design and functionality for the door systems should be documented. TSI PRM point 4.2.2.3. also applies as far as appropriate.

Accepted standards should be added because, among other things: UIC 560, UIC 651, UIC 565 and EN 14752. For stair comes to the requirements of the TSI PRM 4.2.2.11 corresponding as far as physically possible without too much intervention in the construction-accepted standards should be added because, among other things: UIC 555, UIC 560 and EN 13272

5.1.2 Boarding aids

The use of boarding aids to lessen the gap between the platform and the vehicle should always be considered. If the gap between the platform and the vehicle is unjustifiably large, you should for safety reasons are suitable boarding aid on the vehicle or platform for safe boarding and disembarking. The requirements of the TSI PRM point 4.2.2.12 applies to such boarding AIDS.

Accepted standards should be added because, among other things: UIC 560, UIC 565. Lifting device-by installation of lift systems for travelers apply the requirements of the TSI PRM 4.2.2.12 equivalent as long as there is no significant relation to the constructional obstacle to follow the requirements-accepted standards should be added because, among other things: UIC 565/3.

5.2 Interior

5.2.1 Interior doors

Internal doors should be designed and operated so that the safety of passengers and personnel. When closing the doors are going to be able to detect whether passengers or personnel will be jammed, and automatically stop and released for a limited time.

The requirements of the TSI LOC & PAS point 4.2.5.7 and TSI PRM point 4.2.2.3.3 also applies.

Accepted standards should be added because, among other things: UIC 560, UIC 561.

5.2.2 Intercirculation doors

Inside end doors or door equivalent systems at the end of the vehicle should be equipped with a locking mechanism so that the door be locked to prevent accidental review by among other things the lack of transition to the next vehicle or train set.

5.2.3 Clearways

The requirements of the TSI PRM point 4.2.2.6 applies accordingly.

Accepted standards should be added because, among other things: UIC 560, UIC 567.

5.2.4 Floor height changes
The requirements of the TSI PRM point 4.2.2.8 applies accordingly.

5.2.5 Interior lighting

For interior lighting comes to the requirements of the TSI PRM point 4.2.2.4 as far as physically possible. Accepted standards should be added because, among other things: UIC 555, UIC 560 and EN 13272.

5.2.6 Seats and specific PRM event

The requirements of the TSI PRM point 4.2.2.1 applies as long as there is no significant relation to the constructional obstacle to follow requirements.

Accepted standards should be added because, among other things: UIC 565, UIC 566, and EN 12663.

5.3 Handrails

The requirements of the TSI PRM point 4.2.2.9 and 4.2.2.1 apply accordingly.

Accepted standards should be added because, among other things: UIC 535, UIC 560, UIC 565-3 and EN 14752.

5.4 Windows

Windows should have the design and characteristics that make that safety for passengers and personnel. The requirements of the TSI LOC & PAS point 4.2.2.9, 4.2.5.9 applies accordingly.

Accepted standards should be added because, among other things: UIC 560, UIC 564, UIC 651, UIC 617 and UIC 625.

5.5 Toilets

To install toilets on board the passenger vehicle to the extent it is necessary. The requirements of the TSI LOC & PAS point 4.2.2.9 and 4.2.5.1 applies. Climatic conditions must be taken into account in the design and use of the toilet systems so that the functionality is assured by all foreseeable operational conditions.

If it installs toilets suitable for wheelchair comes to the requirements of the TSI PRM point 4.2.2.5 accordingly. Accepted standards should be added because, among other things: UIC 563.

5.6 Heating, heating and air conditioning systems

The requirements of the TSI LOC & PAS point applies 4.2.5.8. The ventilation system should be designed and operated so that it does not contribute to spreading smoke or other toxic gases in case of fire.

Accepted standards should be added because, among other things: UIC 553, EN 13129, EN 14750 and EN 14813.

5.7 passenger information

5.7.1 Public address system
It should be a communication system on Board that leads should be able to give messages to the travelers. The requirements of the TSI LOC & PAS point 4.2.5.1 and PRM TSI 4.2.2.7 corresponding point applies as far as is appropriate for existing vehicles and communication system.

Accepted standards should be added because, among other things: UIC 176.

5.7.2 Signs and information

Emergency exits and escape routes should be marked so that the evacuation can be conducted in a secure manner.

For signage and information for the traveler comes to the requirements of the TSI LOC & PAS point 4.2.5.2 and PRM TSI 4.2.2.7 point accordingly. The information provided must be at least on the Norwegian.

6 Environmental conditions and aerodynamic effects

This chapter applies to all vehicles, unless otherwise specified.

6.1 Impact of the environment on the vehicle

6.1.1 Environmental conditions impacting on the vehicle

6.1.1.1 Altitude

Vehicles must meet the requirements associated with the operation of the current levels of the sea as stated by the standard a-50125 1. General the requirements of the TSI LOC & PAS point 4.2.6.1 and TSI WAG point 4.2.5 applies so far as it is appropriate with regard to the geographical conditions.

6.1.1.2 Temperature

Vehicles must be constructed according to the class in the standard T2 a 50125-1 (-40 + 35 °C). For vehicles which are designed for higher minimum temperatures than -40 °C, operational limitations is considered. General the requirements of the TSI LOC & PAS point 4.2.6.1 and TSI WAG point 4.2.5 applies so far as it is appropriate with regard to the geographical conditions.

6.1.1.3 Humidity

The requirements of the TSI LOC & PAS point 4.2.6.1.3 applies, but the maximum temperature fluctuation that should be taken into account should be up to 40 K. It should exists the possibility of drainage from all safety-critical room or openings where there can be condensation. At the design and operation of electrical and brake systems should be taken into account the condensation and freezing. General the requirements of the TSI LOC & PAS point 4.2.6.1 and TSI WAG point 4.2.5 applies so far as it is appropriate with regard to the geographical conditions.

6.1.1.4 Rain

Vehicles must withstand the rain amounts as stated in the standard a-50125 1 Chapter 4.6. General the requirements of the TSI LOC & PAS point 4.2.6.1 and TSI WAG point 4.2.5 applies so far as it is appropriate with regard to the geographical conditions.

6.1.1.5 Snow, ice and hail

Traction vehicle should have Snowplows according to point 2.1.1.
The vehicle will be the winter test under all foreseeable winter conditions to ensure the normal operation without restrictions. Freezing and icing must be able to be prevented by heating to ensure the normal operation of for instance, toilet tank, water supply, compressed air brake systems, front window, mirror/video term backwards.

The requirements of the TSI LOC & PAS 4.2.6.1.2 attached to the point "difficult" relationship applies accordingly. General the requirements of the TSI LOC & PAS point 4.2.6.1 and TSI WAG point 4.2.5 applies so far as it is appropriate with regard to the geographical conditions.

6.1.1.6 Solar radiation

Vehicles must withstand the rigors of your beam appears of the standard a 50125-1 Chapter 4.9.

6.1.1.7 Resistance to pollution

Vehicle to withstand the pressures caused by chemical substances and particles with polluting effect. Accepted standards should be added because, among other things: EN 60721.

6.1.2 Aerodynamic effects on the vehicle

6.1.2.1 Crosswind effects

At the design and construction of the vehicle, it must be taken into account foreseeable effects of side winds. The requirements of the TSI LOC & PAS point 4.2.6.2.4 also applies. Accepted standards should be added because, among other things: EN 50125, EN 14067

6.1.2.2 Maximum pressure variation in tunnels

At the design and construction of the vehicle, it must be taken into account variations arising from press the input and output of the and the passage of vehicles in tunnels. The requirements of the TSI LOC & PAS point 4.2.6.2.3 also applies. Accepted standards should be added because, among other things: EN 50125, EN 14067, UIC 660.

6.2 Impact of the vehicle on the environment

6.2.1 External emissions

6.2.1.1 Toilet emissions

It is not allowed to use the open toilet systems in rail vehicles. See otherwise point 5.5 in this attachment.

6.2.1.2 Exhaust gas emissions

The requirements of the TSI LOC & PAS point 4.2.8.3 applies. Accepted standards should be added because, among other things: UIC 623 and 624. Directive 97/68/EC, Stage IIIB (2011/88/EU) and Stage IIIA (2004/26/EC) for newer vehicles.

6.2.1.3 Chemical and particulate emission

No special requirements apply.
6.2.2 Limits for noise emissions

6.2.2.1 Stationary noise impact

Stationary noise effect must not exceed that which is allowed according to the TSI NOISE point 4.2.1. Accepted standards should be added because, among other things: UIC 553, UIC 567 and UIC 651.

6.2.2.2 Starting noise impact

Home cloth must not exceed that which is allowed according to the TSI NOISE point 4.2.2 and special case as described under point 7.3.2.3 letter (a), cf. Regulation of 12.11.2015 on the implementation of the TSI NOISE § 2 letter (a).

6.2.2.3 Pass-by noise impact

Pass-by noise must not exceed that which is allowed according to the TSI NOISE point 4.2.3 and special case as described under point 7.3.2.4 letter (a) cf. Regulation of 12.11.2015 on the implementation of the TSI NOISE § 2 letter (b).

6.2.3 Limits for aerodynamic loads impact

6.2.3.1 Head pressure pulses

The requirements of the TSI LOC & PAS point applies 4.2.6.2.2. Accepted standards should be added because, among other things: UIC 660.

6.2.3.2 Aerodynamic impact on passengers/materials on the platform

The requirements of the TSI LOC & PAS point 4.2.6.2.1 also applies.

Accepted standards should be added because, among other things: UIC 660.

6.2.3.3 Aerodynamic impact on track workers

The requirements of the TSI LOC & PAS point 4.2.6.2.1 also applies. Accepted standards should be added because, among other things: UIC 660.

6.2.3.4 Ballast pick up and projection onto neighbouring property

see point 6.1.1.7. In the calculation of vehicle impacts on ballast, one must take into account that the nominal faction for ballast in Norway are 25 to 63 mm.

7 External warning, signaling, marking functions and software integrity requirements

The requirements of this chapter apply to all vehicles that are to be run in or train.

7.1 Integrity of software commonly employed for safety related functions

Software that is used for safety features must be developed and verified according to EN 50128, EN 50129, and EN 50155. It must be made a separate risk assessment for safety relevant functions or for the newer systems that are not based on recognized standards.

Accepted standards should be added because, among other things: EN 50128, EN 50129, EN 50155, UIC 556 and UIC 558.
7.2 Visual and audible vehicle identification and warning functions

7.2.1 Vehicle marking

Vehicle to be marked with operational, technical, and safety information, according to the requirements in or pursuant to the Interoperability Directive. The requirements of the TSI LOC & PAS point 4.2.2.6, OPE TSI point 4.2.2.3 and Appendix H.

Accepted standards should be added because, among other things: EN 15877, UIC 640, UIC 580, UIC 581, UIC 438, UIC 545, UIC 552 and UIC 563.

7.2.2 External lights

7.2.2.1 Headlights

The requirements of the TSI LOC & PAS point applies 4.2.7.1. Accepted standards should be added because, among other things: EN 15153

7.2.2.2 Marker lights

The requirements of the TSI LOC & PAS point 4.2.7.1 applies. Accepted standards should be added because, among other things: EN 15153.

7.2.2.3 End-of-train signal

The requirements of the TSI LOC & PAS point 4.2.7.1 applies. Accepted standards should be added because, among other things: EN 15153.

7.2.2.4 Lamp controls

The requirements of the TSI LOC & PAS point 4.2.7.1.4 also applies to newer vehicles.

Accepted standards should be added because, among other things: UIC 534 and UIC 532.

7.2.3 Audible signal systems

The requirements of the TSI LOC & PAS point 4.2.7.2.1, 4.2.7.2.2, 4.2.7.2.4 apply accordingly.

The following standards are accepted: EN15153-2 and UIC 644. For alert horn protection applies the requirements of the TSI LOC & PAS point 4.2.7.2.3 accordingly. By the design of the protection of the alert horn should in particular be taken into account foreseeable winter conditions, and especially the build up of snow and ice.

7.2.4 Brackets

See point 2.1.5 in the attachment here.

Accepted standards should be added because, among other things: EN 12663, UIC 532, UIC 534, UIC 566 and UIC 644.

8 On-board power supply and control systems
This chapter applies to the traction vehicle, unless otherwise specified.

8.1 Traction performance requirements

No special requirements apply for traction performance.

For excess traction by reduced operations to traction vehicles have sufficient excess traction to be able to drive safely on stretches of climb and tunnels. Geographical and climatic conditions have to be taken into consideration, including determinants and conditions and difficult winter conditions. For claims to the friction between the sprocket and the Rails to geographic and climatic conditions be taken into account; TSI Loc & Pas point 4.2.8.1.2 also applies as far as they are appropriate-see point 4.6.1 in the attachment here.

5.1 Functional and technical specification related to the interface between the vehicle and the energy subsystem

8.2.1 Functional and technical specification related to the electric power supply

8.2.1.1 Specific requirements for the power supply

Vehicle to work satisfactorily with the power supply on the railway infrastructure and the other vehicles that are on the national railway network, and without the other parts of the railway system will be affected negatively.

Accepted standards shall be applied, for instance: EN 50388, EN 50153, UIC 600, EN 50163, UIC 616, UIC 533, UIC 610. The national railway network has the power supply system AC 15 kV 16.7 Hz according to the TSI ENE point 4.2.3. For the effect factor applies to the requirements of the TSI LOC & PAS point 4.2.8.2.6, and the requirements for testing given in TSI LOC & PAS point 6.2.3.19 along with corresponding EN 50388 (: 2012) sections 6 and 14. Effect factor by simple or multiple driving to be calculated and verified against the route the power supply on, show the railway network.

For electric protection applies to the requirements of the TSI LOC & PAS point 4.2.8.2.10 along with the corresponding testing requirements given in EN 50388 (: 2012) point 15.6 with the exception of a short circuit on board as described in EN 50388 (: 2012) point 14.

To prevent unnecessary shut-off of the contact line protection to the maximum value of the start-up current from the transformer or other equipment on board the traction vehicle not exceed 2.0 kA (peak value) in the course of the first two periods (120 ms) after connecting or startup (for example, the connection of high voltage switch) against a rigid tension on the 16500 V. This also applies to the total when several vehicles are controlled together. Compliance with the requirement to be tested at a minimum of 25 connections against a network that has short circuit performance at a minimum of 20 kA. If the connection is synchronized with the utility zero review, 10 connections are sufficient.

8.2.1.2 Voltage and frequency of the overhead contact line power supply

The requirements of the TSI LOC & PAS point 4.2.8.2.2 applies along with the testing requirements given in ENSO163 point 5.

There are no requirements as to the length of "period" under the original Forum: thr_exch_dest_forum described point 4.1 letter f) in EN 50163 if voltage increase is caused by the backfeed of energy. This means that a traction vehicle can generate voltage up to Umax2 continuously by backfeed.
Practical short circuit test as specified in EN 50215 point 9.16.5 shall not be performed on the line, but as a factory test.

8.2.1.3 Regenerative braking

The requirements of the TSI LOC & PAS point 4.2.8.2.3 applies along with the testing requirements given in EN50388 point 15.7.

Because of the contact cable retainer thermal capacity and the contact line protective device ability to detect a short circuit in the same section as the traction vehicle feeder back on, is the national railway network divided into classes with the allowed maximum backfeed effect/power. The classification is indicated by the infrastructure manager in the online guide. Limitation applies to total effect/power from all of the traction vehicle in public management, and can be observed either manually by the driver or by a technical solution.

If the traction vehicle in a satisfactory manner automatically stops the backfeed when there is a short circuit in the same section as the traction vehicle is on, can the limitations due to the contact line protective device ability to detect a short circuit at the same time be mitigated. This functionality should be documented. See also point 8.2.2.10 in the attachment here.

8.2.1.4 Maximum power and maximum train current that is permissible to draw from the overhead contact line

The requirements of the TSI LOC & PAS point 4.2.8.2.4 applies along with the testing requirements given in the TSI LOC & PAS point 6.2.3.18.

The classification of the national railway network in terms of greatest effect and power as there are allowed to draw from the contact wire is specified by the infrastructure manager in the online guide.

Automatic current limiting, low contact line voltage according to a point, 50388 7.2 also be active in normal operation due to the weak power supply.

8.2.2 Pantograph functional and design parameters

8.2.2.1 Pantograph overall design

Requirements of the HS RST TSI applies point 4.2.8.2.9 applies. Accepted standards shall be applied, for instance: EN 50206-1, IEC 494, IEC 1133 and EN 50367.

8.2.2.2 Pantograph head geometry pantograph to have a geometry as described in EN 50367 figure B.6 (1800 mm). On routes specified in the infrastructure manager’s Web Guide, pantographs with a geometry as described in EN 50367 figure A.8 (1950 mm) and figure A. 7 (1600 mm) can be used. The requirements of the TSI LOC & PAS point 4.2.8.2.9.2 second, third and fourth paragraph applies accordingly.

8.2.2.3 Pantograph contact force (including static contact force, dynamic behavior and aerodynamic effects)

For pantograph static contact force to pantographs have a static contact force at 55 N. On routes specified in the infrastructure manager’s network guidance applies to the requirements of the TSI LOC & PAS point 4.2.8.2.9.5 accordingly. For pantograph contact force (including dynamic properties and aerodynamic effects) the requirements of the TSI LOC & PAS point 4.2.8.2.9.6 apply.
accordingly. In addition, the pantographs meet to follow a curve/graph specified according to the following formula:

\[ FM = 0.00097v^2 + 55, \] with a tolerance of ± 10%.

On routes specified in the infrastructure manager's Web Guide meet their pantographs to follow a curve specified according to the following formula:

\[ FM = 0.00097v^2 + 70, \] with a tolerance of 0,-10%.

8.2.2.4 Working range of pantographs

The requirements of the TSI LOC PAS point 4.2.8.2.9.1 also applies. Workrange for pantographs as specified in EN 50367 table B. 3.

8.2.2.5 Current capacity of pantograph including contact strip the requirements of the TSI LOC & PAS point 4.2.8.2.9.3 also applies.

Accepted standards should be added because, among other things: EN 50388 and EN 50206.

8.2.2.6 Arrangement of pantographs

The requirements of the TSI LOC & PAS point 4.2.8.2.9.7 also applies. Accepted standards should be added because, among other things: EN 50367.

8.2.2.7 Insulation of pantograph from the vehicle

The requirements of the TSI LOC & PAS point 4.2.8.2.9.9 also applies.

8.2.2.8 Pantograph lowering

The requirements of the TSI LOC & PAS point 4.2.8.2.9.10 also applies. New vehicle to automatically lower the pantograph in case of towed pieces, using the auto-drop device (ADD). See section 8.2.3.4.

8.2.2.9 Running through phase separation sections or system the requirements of the TSI LOC & PAS point 4.2.8.2.9.8 applies along with the testing requirements given in EN 50388 point 9.4. Also backfeaded effect to be reduced to 0 by the passage of phase separated draws. Vehicle shall be equipped so that it can pass the voltage loose section is not grounded by that pantograph is lowered or linked out.

8.2.3 Contact strip functional and design parameters

8.2.3.1 Contact strip geometry

The requirements of the TSI LOC & PAS point 4.2.8.2.9.4.1 also applies. The geometry of the contact strip shall follow EN50206-1 point 4.6 and EN 50367 Annex B, figure B5. For tracks specified in the infrastructure manager’s network can also guide EN 50367 Annex A, point A 2.2 be followed. This point must be seen in the context of the point in the annex 8.2.2.2 here.

8.2.3.2 Contact strip material

The requirements of the TSI LOC & PAS point 4.2.8.2.9.4.2 also applies. Material in the thick can be towed pure carbon or carbon with metallized metal weight up to 35%. See EN 50206-1, EN 50367 and UIC 608.
8.2.3.3 Contact strip assessment

The requirements of the TSI LOC & PAS point applies 6.1.3.8. Accepted standards should be added because, among other things: EN 50405

8.2.3.4 Detection of contact strip breakage

New vehicle to automatically lower the pantograph in case of towed pieces, using the auto-drop device (ADD). See point 8.2.2.8 in the attachment here.

5.2 Electrical power supply and traction system

8.3.1 Energy consumption measurement

The requirements of the TSI LOC & PAS point 4.2.8.2.8 also applies.

8.3.2 Requirements for electrical installations "topic on-board of a railway vehicle

The requirements of the TSI LOC & PAS point applies 4.2.8.2. Traction vehicle should have built-in technical possibility of limitation of maximum power consumption according to the limit values specified in the infrastructure manager’s Web Guide

8.3.3 High voltage components

No special requirements apply.

8.3.4 Earthing

The requirements of the TSI LOC & PAS point 4.2.8.4 applies.

It should be the necessary information about disconnection and earthing of the vehicle either as labels/signs sticker vehicle or as easy to understand manuals in each vehicle (individual) to be able to handle the situations. Requirement does not apply to information which is obvious or can be assumed to be public knowledge for those who are set to make this special task.

Earthing instructions, equipment and marking is specified in EN 50153

5.2 Electromagnetic Compatibility (EMC)

8.4.1 EMC within the vehicle "That must be carried out tests of electromagnetic compatibility of the power supply system on board and other onboard equipment, such as train control system, according to EN 50121, TS 50238-2 and TS 50238-3.

Where people on board can be exposed to electromagnetic fields must be taken into account to allow limit values.

6.4.2 EMC between the vehicle and the railway system

It must be performed tests of electromagnetic compatibility between the vehicle and the signal and telecommunications online according to EN 50121, TS 50238-2 and TS 50238-3. Vehicles must not affect other vehicles and the ground-based portion of the rail system. Infrastructure equipment, such
as track section-and axle counter types, evident from the online guide. Declaration according to regulation 22. January 2007 Nr. 89 about electromagnetic compatibility (EMC) for electronic communications must be released.

The main switch must be disconnected automatically if the power in all frequency ranges with 1 Hz frequency gap in the regions 92-98 Hz and 102-108 Hz is equal to or greater than 2 Arms in minimum 1.0 s.

Accepted standards should be added because, among other things: EN 50121.

8.4.2.1 Maximum currents

8.4.2.1.1 Rail return current

No special requirements apply

8.4.2.1.2 Heating cable interference current

No special requirements apply

8.4.2.1.3 Interference current under the vehicle

No special requirements apply

8.4.2.1.4 Harmonic characteristics and related overvoltage on the overhead contact line

The national requirements that apply to this parameter has a text longer than the database allows. The complete text can be found in the field-DESCRIPTION-the requirements of the TSI LOC & PAS point 4.2.8.2.7 also applies. In addition to the to ensure technical compatibility also collected information from the infrastructure manager according to the EN50388 Appendix D because the information in the EN50388 Appendix D is not sufficient to ensure technical telephone and between vehicles and the infrastructure of the national railway network.

By testing the vehicle's technical compatibility with the power supply on the national railway network the following conditions shall be taken into account:-in General, the weak power supply characterized with long feeding circuits, single track (IE. high feeding line impedance) and rotating converters as well as static converters from 50 Hz to 16 2/3 Hz with little performance

-Low-frequency pending by feeding from the Rotary converter aggregates due to a low frequency electro-mechanical damping own

-High content of harmonic (over 30% THDu) in the contact line voltage, especially 3. and 5. harmonious and repetitive high peak values of the voltage (up to 33 kV) because of the many existing traction vehicle with half ruled tyristor-bridge.

-The use of automatic limitation of effect/power at low contact line voltage and capacitive compensation for increased transmission capacity at long feeding circuit.

-The use of automatic limitation of effect/power at high contact line voltage and inductive compensation to limit the contact line voltage at backfeed.

-Low electric resonance frequency because of the large proportion of cable in the infrastructure and passive filters in existing traction vehicles "

8.4.2.1.5 Effects of DC content in the AC supply
Electric traction vehicles should be designed so that they are not affected by the limited DC content in the AC power supply. Limit values for the DC content is specified by the infrastructure manager and be validated by testing.

EN 50388 point 13 also applies with additional information on the direct current up to 40 A in 60 seconds and 70 A short-lived is measured on existing vehicles on the national railway network due to the rim of the contact wire.

8.4.2.2 Maximum Electro-Magnetic fields/Induced voltages

8.4.2.2.1 Electro-Magnetic fields/Induced voltages in the track/under the vehicle

No special requirements apply.

8.4.2.2.2 Electro-Magnetic fields/Induced voltages outside the track

No special requirements apply.

8.4.2.3 Vehicle entrance impedance

No special requirements apply.

8.4.2.4 Psophometric current

Psofometrisk noise power generated by the train in the catenary shall not exceed 1.5 a.

8.4.2.5 Transverse voltage limits for compatibility voice/data circuits

No special requirements apply.

8.4.3 EMC between the vehicle and the environment

8.4.3.1 Maximum Electro-Magnetic fields

No special requirements apply.

8.4.3.2 Induced interference current/voltage "Induced broadband interference power/voltage (NO parameter)"

Additional requirements for (possibly) other specified limit values for the same frequencies in connection with the train detection:

-92 Hz-300 Hz, power should be measured and documented.

-300 Hz-7 kHz, maximum 1 A RMS continuous 1 sec.

-7 kHz-9 kHz, Max 0.5 A continuous RMS 1 sec.

> 9 kHz, maximum 0.33 A RMS continuous 1 sec.

Calculation:

FFT with 8 1/3 Hz resolution (120 ms time window) followed by 1 sec sweeping along the time-scale axis RMS for each FFT interval. Limit value applies to each FFT interval.

8.4.3.3 Psophometric current
No special requirements apply.

8.5 Protection against electrical hazards including earthing

The requirements of the TSI LOC & PAS point 4.2.8.4 and point WAG TSI 4.2.7.3 applies.

5.3 Diesel and other thermal traction system requirements

The requirement of the TSI LOC & PAS point applies 4.2.8.3. For exhaust emission, see 6.2.1.2 in this attachment.

5.4 Systems requiring special monitoring and protection measures

8.7.1 Tanks and pipe systems for flammable liquids

Containers and pipe connections should be located and protected so that damage, leaks, fire or spread of fire is not possible under normal and foreseeable operating situations. The requirements of the RID and TSI LOC & PAS point 4.2.10.2.2 and TSI WAG point 4.2.6.1.2.4 also applies. Accepted standards should be added because, among other things: EN 45545, EN ISO 2719.

8.7.2 Pressure vessel systems/pressure equipment

Press container systems and press equipment should follow the Directive 2009/105/CE.

Accepted standards should be added because, among other things: EN 286

8.7.3 Steam boiler installations "topic

No special requirements apply.

8.7.4 Technical systems in potentially explosive atmospheres

See point 8.7.1 in this attachment

8.7.5 Hydraulic/pneumatic supply and control systems

See point 6.1.1.3 in this attachment. The requirements that apply to difficult snow-, ice-and hail conditions in TSI LOC & PAS point should be added to 4.2.6.1.2 reason for any vehicle to operate without restrictions on the national railway network.

Vehicles that have brake based on compressed air to have systems for the production of compressed air that takes into account climatic conditions, especially difficult winter conditions. Compressed air system to contain equipment that ensures the production of dry and clean compressed air. By assessment of moisture level applies to this attachment point in 6.1.1.3 accordingly.

9 Staff facilities, interfaces and environment

The requirements of this chapter apply traction vehicles with cabs, as long as nothing else is stated by each requirement.
5.7 Driver's cab design

9.1.1 Interior layout

The requirements of the TSI LOC & PAS point 4.2.9.1.4 also applies.

Accepted standards should be added because, among other things: EN 13272, EN 16186, EN 14033 EN 16116, UIC 617, and UIC 651.

9.1.2 Access to driver's cab

9.1.2.1 Access, egress and doors

The requirements of the TSI LOC & PAS point 4.2.9.1.2.1 also applies to newer vehicles.

Accepted standards should be added because, among other things: EN 14752, UIC 646 and UIC 651.

9.1.2.2 Driver's cab emergency exits

The requirements of the TSI LOC & PAS point 4.2.9.1.2.2 and TSI SRT point 4.2.3.4.2 applies to newer vehicles.

Accepted standards should be added because, among other things: EN 14752 and UIC 651.

9.1.3 Windscreen in the driver's cab

9.1.3.1 Mechanical characteristics

The requirements of the TSI LOC & PAS point 4.2.9.2.1 also applies to newer vehicles.

Accepted standards should be added because, among other things: UIC 651, UIC 617 and EN 15152.

9.1.3.2 Optical characteristics

The requirements of the TSI LOC & PAS point 4.2.9.2.2 also applies.

Accepted standards should be added because, among other things: UIC 651, UIC 617 and EN 15152.

9.1.3.3 Equipment to the windscreen

The requirements of the TSI LOC & PAS point 4.2.9.2.3 also applies.

9.1.3.4 Front visibility/visibility field

The requirements of the TSI LOC & PAS point 4.2.9.1.3.1 and TSI CCS 4.2.15 applies accordingly.

Accepted standards should be added because, among other things: UIC 525 and EN 15152.

9.1.4 Desk ergonomics

The requirements of the TSI LOC & PAS point 4.2.9.1.6 also applies.

Accepted standards should be added because, among other things: UIC651.
9.1.5 Driver's seat

The requirements of the TSI LOC & PAS point 4.2.9.1.5 also applies.

Accepted standards should be added because, among other things: UIC651.

9.2 Health and safety

9.2.1 Environmental conditions

9.2.1.1 Heating, heating and airconditioning systems in driver's cab

The requirements of the TSI LOC & PAS point 4.2.9.1.7 also applies.

Accepted standards should be added because, among other things: EN 14813 and EN 13129.

9.2.1.2 Noise in driver's cab

By changes must not the noise level in the cab, Inc. The requirements of regulation 26. April 2006 no. 456 on protection against noise in the workplace applies, but permission to authorisation to place in service after the regulation here is given regardless of the fulfillment of the requirements. The requirements of the TSI Noise point 6.2.2.4 and TSI Loc & pas point 4.2.9.1.1 also applies. Accepted standards should be added because, among other things: EN 15892

9.2.1.3 Lighting in driver's cab

The requirements of the TSI LOC & PAS point 4.2.9.1.8 also applies.

Accepted standards should be added because, among other things: EN 13272, UIC 651 and UIC 555

9.2.2 Other health and safety requirements

No special requirements apply.

9.3 Driver/machine interface

9.3.1 Speed indication

There must be a device that shows the correct speed to the driver. The requirements of the TSI LOC & PAS point 4.2.9.3.2 also applies.

Accepted standards should be added because, among other things: UIC 617 and UIC 612.

9.3.2 Driver display unit and screens

The requirements of the TSI LOC & PAS point 4.2.9.3.3 also applies.

Accepted standards should be added because, among other things: UIC 612.

9.3.3 Controls and indicators

The requirements of the TSI LOC & PAS point 4.2.9.3.4 also applies.
Accepted standards should be added because, among other things: UIC 612.

9.3.4 Driver supervision
The requirements of the TSI LOC & PAS point 4.2.9.3.1 also applies.
Accepted standards should be added because, among other things: UIC 641.

9.3.6 Rear and side view
The requirements of the TSI LOC & PAS point 4.2.9.1.3.2 applies, but in addition, the driver could see backward along the train while driving. The equipment must be able to give the term backwards at all the foreseeable climatic conditions, in particular by dew, frost and ice formation.

5.8 Marking and labelling in driver's cab
The requirements of the TSI LOC & PAS point 4.2.9.3.5 also applies. The information should be in a language the user contains.
Accepted standards should be added because, among other things: UIC 640, UIC 612.

9.5 Equipment and other facilities on-board for staff
9.5.1 Facilities onboard for staff
9.5.1.1 Staff access for coupling/uncoupling
The requirements of the TSI LOC & PAS point 4.2.2.5 and TSI WAG point 4.7 applies accordingly.
Accepted standards should be added because, among other things: a 50153, UIC 521, UIC 571 and UIC 536.
9.5.1.2 External steps and handrails for shunting staff
For goods wagons applies the requirements of TSI LOC & PAS point 4.2.9.1.2.1 and TSI WAG point 4.2.2.2 accordingly.
Accepted standards should be added because, among other things: UIC 535, UIC 560 and UIC 646.
9.5.1.3 Storage facilities for use by staff
The requirements of the TSI LOC & PAS point applies 4.2.9.5, but storage facilities for staff must be adapted to the need for storage of necessary personal equipment with regard to climatic conditions.

9.5.2 Staff and freight access doors
Doors for staff and goods should be designed and equipped so that they can be operated only by authorized staff.
The requirements of the TSI LOC & PAS point 4.2.2.8 applies. See also section 5.1.1, 5.1.2 and 9.1.2.1 in this attachment.
Accepted standards should be added because, among other things: EN 14752 and UIC 560.

9.5.3 On-board tools and portable equipment

The requirements of the TSI LOC & PAS point 4.2.9.4 applies.

9.5.4 Audible communication system

Person alert system in paragraph 5.7.1 in this attachment should also be able to be used for communication between onboard personnel or communication between onboard personnel and outside personnel. The requirements of the TSI LOC & PAS point 4.2.5.2 and 4.2.5.4 applies.

Accepted standards should be added because, among other things: UIC 558, UIC 561, UIC 568 and UIC 751.

9.6 Recording device

All traction vehicles shall be equipped with a technical registration system that at least captures the speed. All the information available from the automatic speed surveillance system should be saved and restored to use by any investigation of railway accidents, serious railway incidents and rail events. The requirements of the TSI LOC & PAS point 4.2.9.6 applies.

9.7 Remote control function from the ground

The requirements of the TSI LOC & PAS point 4.2.9.3.6 also applies. Remote-controlled systems must be within the acceptable risk confirmed by safety assessment report.

10 Fire safety and evacuation

10.1 Fire protection concept and protection measures

Vehicles should not contain flammable materials. The materials used shall in the least possible degree emit smoke and harmful fire gases in the event of fire.

The requirements of the TSI LOC & PAS point 4.2.10 applies accordingly. The requirements of the TSI WAG point 4.2.6.1 applies accordingly. The requirements of the TSI SRT point 4.2.3 applies accordingly. Fire safety for dedicated vehicle types, traction vehicles for goods transport, OTM, shift vehicle, infrastructure vehicles for inspection or maintenance with or without personnel on board, to be specified separately. In high risk areas such as the diesel engine room and sleeping carriages, there must be fire detectors. For all newer vehicles are fire detectors mandatory.

Accepted standards should be added because, among other things: EN 45545, UIC 564 and UIC 642.

10.2 Emergency

10.2.1 Passenger evacuation concept

The requirements of the TSI LOC & PAS point 4.2.10.5 also applies. Furthermore, it should be added specifically to facilitate the evacuation of the orientation and mobility impaired. Emergency exits for dedicated vehicle types, traction vehicles for goods transport, OTM, shift vehicle, infrastructure vehicles for inspection or maintenance with the personnel on board, to be specified separately.

Accepted standards should be added because, among other things: UIC 560, UIC 564-1, UIC 651 and EN 13272.

10.2.2 Rescue services, information, equipment and access
It should be added to facilitate the rescue personnel can operate effectively the rescue work.

Vehicles should have the emergency equipment on board adapted to the use. Emergency equipment and the placement of this to be selected.

10.2.3 Passenger alarm

It shall be possible for passengers to alert the driver of an emergency by using an alarm function, or the use of the emergency stop. See point 4.4.1 of this attachment for the activation of the emergency brake. The requirements of the TSI LOC & PAS point 4.2.5.3 and 4.2.10.4.3. and TSI SRT point 4.2.3.3.3 also applies.

Accepted standards should be added because, among other things: UIC 541.

10.2.4 Emergency lighting

Vehicles to have emergency light. The requirements of the TSI LOC & PAS point 4.2.10.4.1 also applies. TSI SRT point 4.2.3.3.1. applies accordingly.

Accepted standards should be added because, among other things: UIC 555.

10.3 Emergency running capabilities

The requirements of the TSI LOC & PAS point 4.2.10.4.2 and 4.2.10.4.4. applies accordingly. It should be worked out the safety assessment report, procedures and safety-related measures in emergency situations, such as for running through long tunnels with fire on board.

11 Servicing

11.1 Train cleaning facilities

The requirements of the TSI LOC & PAS point 4.2.11.2 applies.

11.2 Train refueling facilities

11.2.1 Waste water disposal systems

The requirements of the TSI LOC & PAS point applies 4.2.11.3. The interface for the clear system for waste water can vary. Adapters are required for customization.

11.2.2 Water supply system

The requirements of the TSI LOC & PAS point 4.2.11.4 also applies. The interface for the water supplying may vary. Adapters are required for customization.

11.2.3 Further supply facilities

On the national railway network provided train heating records with three-phase supply 400 V 50 Hz, single phase 1000 V 16.7 Hz and/or single phase 1000 V 50 Hz at selected locations. The requirements of the TSI LOC & PAS point 4.2.11.6 as far as it applies to suits. All the requirements apply to the entire composition of the vehicles that will be connected on train heat record.
For the use of three-phase 400 V 50 Hz train heat record (open point in TSI and TSI LOC PAS point 4.2.11.6) to the vehicle's train hot contact be a circular plug 436-6 with pilot contact (L1-L2-L3-N-PE-pilot). The pairing should be according to the UIC 556-1:1979, plate IV.

Train heat the voltage and frequency can be expected to vary as specified in paragraph 8.2.1.3 for 16.7 Hz facilities adjusted for transformer convertor at 15:1 to 16.5:1 and as specified in a 2007 50160:50 Hz-plants.

Vehicles that connect to trains going to have hot mail automatically interlock against to connect the voltage from the train heat record, catenary and other forms of power supply. The claim should be verified with the help of a technical and functional description. Specified manual operating routines to be established and be followed where technically interlock is incomplete or not yet established.

For the requirements for harmonic and dynamic properties/characteristics apply requirements equivalent to the connection contact cord provided in point 8.2.1.7.1 in this attachment.

To ensure the selectivity to the first State-of-the value of start- up current by the connection of a vehicle to a train heat record not exceed 2.0 kA with the connection against a stiff 1000 V voltage source. This should be verified with the minimum of 25 connections against a train heating post with minimum short circuit performance on the 4kA.

Maximum impact and power as it is allowed to draw from one train heat record is entered in the online guide.

11.2.4 Interface two refueling equipment for non-electric rolling stock

The requirements of the TSI LOC & PAS point 4.2.11.7 also applies.

12 On-board control command and signaling

12.1 On-board radio system

12.1.1 Non-GSM-R radio system

It is allowed to use other communication systems in addition to GSM-R in connection with shunting.

12.1.2 GSM-R compliant radio system

12.1.2.1 Use of hand portables as cab mobile radio

Three power vehicle to have hard-wired GSM-R 8W portable mounted cab radio with external antenna for use in train performance and for emergency communication, so that at any given time is mutual opportunity for rapid contact between leads and traffic control unit. Such radio should meet the requirements of EIRENE standard. In addition, it may be necessary with an available handheld GSM-R device that enables the driver to use in the situations where it must be performed tasks outside the driver's room. Beyond this is no requirement beyond that provided by EIRENE standard.

12.1.2.2 Other GSM-R requirements

It must be carried out a risk assessment of matters related to border crossing. This must at least deal with the frequency limitations, the installation of filters to reduce the interference (see also new section 12.2.3) and key management. Only manual procedures for the selection of the GSM-R network is accepted. By the way comes to no requirements beyond what follows from EIRENE standard.
12.2 Onboard signaling

12.2.1 National onboard signaling systems

Traction vehicles that will be used on routes that are equipped with automatic speed surveillance of class B should have equipment that can interact with this. Class B equipment is allowed in Norway disclosed in the TSI CCS Appendix B—see also point STM requirements 12.2.2. Accepted standards should be added because, among other things: EN 50129.

12.2.2 STM requirements

Norwegian railway supervision should have complementary requirements for STM-device. To ensure technical compatibility and safe integration is the testing of management and control equipment by the integration of this equipment in the vehicle (integration testing). Infrastructure manager has complete provisions on integration testing in technical regulations book 590. STM-device to communicate securely with the class B system.

The following should be documented:

a) description of the STM device. Description of all interfaces that are not part of the TSI CCS.

b) comply with the specification for STM device (ref. supplementary provisions from the SJT).

c) ISA report for compliance with the requirements of EN 50126, EN 50128 and ENS0129

d) safety report confirming the safe integration of STM-device in the relevant subsystems, see. section 14 d)

e) safety report that confirms the secure integration between your vehicle and the Norwegian railway system, cf. section 14 e) or section 15 e), including the integration tests.

12.2.3 Transitions

It must be carried out a risk assessment of matters related to border crossing (Directed/automatic network selection). This must at least deal with the frequency limitations, network selection, installation of filters to reduce the interference (see also point 12.1.2.2) and key management. Only manual procedures for the GSM-R network options are accepted.

12.2.4 Compatibility of rolling stock with CCS Trackside

12.2.4.1 Minimum axle distance

Risk assessment and testing for verification of compatibility between vehicles and rail infrastructure. The requirements in this area applies for 50238 as far as appropriate. The requirements of the TSI CCS Annex A along with the demands of the ERA/ERTMS/033281 applies as far as appropriate. Vehicles that will be compatible with class B train protection system must also have the minimum distance 3000 mm between the outer axles and a maximum of 17500 mm distance between the nearest shafts.

12.2.4.2 Minimum wheel diameter
The requirements of the TSI CCS Annex A along with the demands of the ERA/ERTMS/033281 applies as far as appropriate. Risk assessment and testing for verification of compatibility between vehicles and rail infrastructure. The requirements in EN 50238 applies for as far as appropriate.

12.2.4.3 Metal and inductive components-free space between wheels risk assessment and testing for verification of compatibility between vehicles and rail infrastructure. The requirements in this area applies for 50238 applies as far as appropriate. The requirements of the TSI CCS Annex A along with the demands of the ERA/ERTMS/033281 applies as far as appropriate.

12.2.4.4 Metal mass of a vehicle

For safe train detection must minimum shaft press be over 5 tons, and also, the influence of the coating from the sand and composite brake block be considered separately-see also point 3.3.4 and 3.3.5 in this attachment. The requirements in EN 50238 applies as far as appropriate. The requirements of the TSI CCS Annex A along with the demands of the ERA/ERTMS/033281 applies as far as appropriate.

12.2.4.5 Compatibility with fixed installations of CCS

The requirements of the TSI CCS Annex A along with the demands of the ERA/ERTMS/033281 applies as far as appropriate.

12.2.5 ETCS cab signaling system

12.2.5.1 Level crossing functionality

no special requirements apply.

12.2.5.2 Braking safety-margin

no special requirements apply.

12.2.5.3 Reliability-Availability Requirements

RAMS-requirements for ETCS onboard equipment specified by the infrastructure management

12.2.5.4 Safety Requirements

no special requirements apply.

12.2.5.5 Ergonomic aspects of DMI

No special requirements apply.

12.2.5.6 Interface with service brake.

It must be carried out risk assessment and test validation of interface between ETCS-onboard equipment and the campaign's braking system.

12.2.5.7 Other ETCS Requirements (related to existing not interoperable networks)

ETCS-requirements when the vehicle is not operated from drivers cab: it must be a safety evidence to be used if ETCS by remote control, etc. by shunting; feature to be tested and validated. The Key Management requirements compliance: It must be carried out a risk assessment for Key Management, etc. requirements that deal with the interface to modify crypto keys.
12.2.5.8 Specification of condition of use where ETCS onboard does not implement all the functions, interfaces and performances

That have to be carried out risk assessment for all ETCS-on board features that differ from the TSI CCS and compatibility test will be implemented. Conditions of use should be mentioned separately.

13. Specific operational requirements

13.1 Specific items to place on-board

Traction vehicles should be equipped with first aid equipment for personnel and travelers, equipment for short circuit of the track fields mm. Vehicles shall have suitable equipment for evacuation, and suitable equipment for rescue situations. By the way to vehicle be equipped in line with that imposed by Chapter 10 of the attachment here.

13.2 Ferry transport

No special requirements apply. The following standards are accepted UIC 507

14 Freight-related items

14.1 Design, operation and maintenance constraints for the transport of dangerous goods

No special requirements beyond what follows from the regulation 1. April 2009 Nr. 384, on the land transport of dangerous goods. The requirements of the TSI WAG point 4.2.2.6 applies accordingly.

14.2 Specific facilities for the transport of freight

By the use of special devices for the transport of goods to accepted standards be added to because, among other things: UIC 576.

14.3 Doors and loading facilities

See point 9.5.2 in this attachment. For boxcars comes to WAG TSI point 4.2.2.3 accordingly.

For doors and loading devices to accepted standards be added to because, among other things: UIC 576.