INTEROPERABILITY UNIT

Guide for the application of the OPE TSI

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1. INTRODUCTION

The purpose of this document is to clarify certain concepts and procedures referred to in Directive 2008/57/EC on the interoperability of the rail system within the European Union and the related technical specifications for interoperability (TSI) for Operation and Traffic Management (OPE) subsystem.

This application guide gives an overview of the OPE-subsystem and indicates where, in the TSI, to locate the principles of the application of the TSI OPE. Where necessary, it gives additional information and explanation on specific requirements contained within the TSI OPE.

The status of this document is not legally binding; it clarifies certain concepts and procedures as stated above and shall thereby support the common understanding on the TSI OPE.

In order to comply with Chapter 7 of TSI OPE on implementation, Member States have to develop an implementation plan which sets out how TSI OPE requirements will be complied with, the links to National Rules and responsibilities of stakeholders. To support Member States, ERA has developed a template for the National implementation plan for voluntary use which has been accepted at RISC level. This template is accessible on ERA website (www.era.europa.eu) under TSI OPE page.

2. REFERENCES, TERMS AND ABBREVIATIONS

2.1 Reference documents

Table 1: Reference documents

Ref. No	Document reference	Official Journal	Last amendment	Version
[1]	Directive 2008/57/EC (Interoperability)	L 191, 18.7.2008	Directive 2009/131/EC	
[2]	Directive 2004/49/EC (Safety)	L 164, 30.4.2004	Directive 2008/110/EC	
[3]	'Traffic Operation and Management' TSI 2012/757/EC	OJ L 345, 15.12.2012, p. 1		
[4]	Train Drivers Directive 2007/59/EC	L 315, 03.12.2007		
[5]	EN 14198: 'Railway applications – Braking – Requirements for the brake system of trains hauled by a locomotive'	Not applicable	2004	
[6]	UIC 544-1: 'Brakes – Braking Power'	Not applicable	October 2004	
[7]	EN 14531: 'Railway applications – Methods for calculation of stopping distances, slowing distances and immobilization braking – Part 1: General algorithms'	Not applicable	April 2005	
[8]	Commission Regulation (EC) No 352/2009 on the adoption of a common safety method on risk evaluation and assessment as referred to in Article 6(3)(a) of Directive 2004/49/EC of the European Parliament and of the Council	L 109, 29.04.2009		
[9]	Commission Decision 2007/756/EC (NVR)	L 305, 23.11.2007	Decision 2012/757/EU	
[10]	Directive 2012/34/EU Single	L 343, 14.12.2012		

Table 1: Reference documents

Ref. No	Document reference	Official Journal	Last amendment	Version
	European Railway Area			

2.2 Definitions and abbreviations

Definitions and abbreviations are given in the general part of the 'Guide for the application of TSIs'.

3. OPE SUBSYSTEM

3.1 TSI OPE and connection to other relevant rules and regulation

The *TSI Operation and Traffic Management* does not provide a complete description of Railway Operations. It should not be read in isolation when applying the TSI. It must be used in connection with all other relevant legislative documents setting out requirements on the business of operating railways. For example, although TSI OPE stipulates operational requirements, it does not cover all the elements necessary to ensure the complete safe operation of the railways, which is a requirement of the safety management system as set out in Articles 4 and 9 of the Safety Directive [2].

The relevant legislative documents include:

- Safety Directive 2004/49/EC;
- Interoperability Directive 2008/57/EC;
- Single European Railway Area Directive 2012/34/EC;
- Train Drivers Directive 2007/59/EC;
- TSIs;
- Regulations on CSM for conformity assessment 1158/2010 and 1169/2010;
- Regulation on CSM on Risk assessment 402/2013.

The purpose of the TSI OPE is to provide a link to all the advanced preparations required and to assist with the continued safe operation of passenger and freight trains in line with the RU and IMs responsibilities.

The operation of the railway comprises of several parts:

- A general part:

1) An organisation/company should be established.
   The organisation shall develop a management system which includes a Safety Management System. The SMS covers several elements related to the TSI OPE including a risk assessment process and a competence management system.
2) Suitable equipment should be organised (purchased, leased).
3) Following the systematic approach described in the SMS, the relevant rules and procedures for each level of operation should be identified and developed; specific and detailed rules and procedures should be put in place. This includes also the interfaces to (sub-)contractors. For more details see the Safety Directive [2].
4) For all the steps listed the relevant approvals (licence, *Safety Certificate, authorisations for placing in service* of the different structural subsystems and vehicles) should be obtained from the competent *national safety authorities* of the Member States.

- A part specific for each train:

1) Train path allocation:
The operator of the train must obtain a train path. The request for a path as well as the allocation has to be done under the rules applying the "*Directive on allocation of paths and the levying of charges*" 2012/34/EC.

2) Train operation

Train operation starts when the train path has been allocated. The train operation includes the preparation of the train and the train running. The operation of the train is in the scope of the TSI OPE. The TSI OPE defines the interfaces between IM and RU to ensure that both operate the train on a common understanding of their different responsibilities.

All necessary preparations should be done before the train can start to run. Some of these requirements are linked with last minute train preparation before departure (like checks and tests before departure, see point 4.2.3.3.1). Other elements require more time and organisation. For example, the IMs and RUs have to ensure that all the staff operating trains (train driver and other train crew members for the RU; signaller, and all other relevant staff of the IM even if not mentioned in the TSI OPE like dispatchers, level crossing guards) know what to do, how to do it and when to do it. This includes the steps already mentioned; setting up the rules and ensuring that the staff is competent for the tasks.

However, TSI OPE does not cover all interfaces between IM and RU. The TSI focuses on the interfaces relevant for interoperability as defined in the Interoperability Directive *(the safe and uninterrupted movement of trains)* and defines the responsibilities at the interfaces. Some interfaces between IM and RU are not relevant for interoperability (like shunting or subcontracted train departure procedures) and therefore are not covered by the TSI.

Although some interfaces are not covered by the TSI, it is self-evident that IM and RU must identify the interfaces and the risks associated with them. If need be, the IM and RU must set up procedures for the exchange of information (or perhaps even materials) in order to fulfil their obligations. For more details refer to the Guide on the Safety Management System.

Besides the scope of the TSI, it is recommended that IMs and RUs when taking forward other functions (i.e. IM operating maintenance trains) to apply the requirements set out in the TSI OPE to ensure internal consistent application of these parts of the processes.

In addition to the railway-specific requirements stipulated in the documents mentioned above, the Council Directive 2008/114/EC on the identification and designation of European critical infrastructures and the assessment of the need to improve their protection should be taken into account by Member States and subsequently by the IMs.

3.2 Geographical scope of the TSI

The scope of the Interoperability Directive [1] covers the entire rail system of the European Union. This TSI covers the whole of the European rail network within the scope of the Interoperability Directive with one difference: Member States have to exclude those parts of the rail network where the Interoperability Directive itself is not applied. This may only be done within the limits set out in Article 1(3) of the Interoperability Directive. From a geographical point of view, the scope of this TSI excludes explicitly all parts of the rail network that are covered by the definitions of Article 1 (3) of the Interoperability Directive even without the explicit exclusion by the respective Member State. Nevertheless the TSI OPE should be used by companies operating both on the network included in the scope and on parts of the network that are excluded from the TSI's scope in order to facilitate consistency and to avoid different systems within companies operating on lines within and those out of the scope of TSI OPE.

Requirements in this TSI that refer to structural subsystems and are listed in the interfaces (section 4.3) are assessed under the relevant structural TSIs. Those requirements only apply to technical subsystems that are new or have been upgraded or renewed according to Article 20 of Directive 2008/57/EC.

3.3 Assessment of compliance with the OPE TSI

The subsystem operation and traffic management is a functional subsystem. The assessment principles are laid down in chapter 6.2 of the TSI. The TSI OPE defines requirements on processes and procedures to be established by IMs respectively RUs under their SMS. Section 4.3 sets out the interfaces with structural TSIs and the technical requirements. This means that these technical requirements are not to be assessed against the TSI OPE. They are to be assessed by the Notified Bodies during the process for the authorisation for placing into service of structural subsystems as described in those relevant structural TSIs.

The compliance with the TSI OPE cannot be assessed like the conformity of a structural subsystem. The EC verification procedure is not applicable. The procedures and processes required by the TSI OPE should become part of operational rules and procedures. They also become a part of the IM's / RU's SMS. The compliance with the TSI OPE should be demonstrated when the NSA assesses the SMS before granting the *safety authorisation/ certificate* (see Articles 10 and 11 and Annex III of the Safety Directive) and when the NSA performs supervision and inspections (See Regulations 1158/2010, 1169/2010 and 1077/2012). The NSA should also check that the operational rules used by the RU/IM do not contradict the requirements in the TSI OPE. In addition EC Regulation 1078/2012 requires that RUs and IMs set out processes and procedures to effectively monitor the effectiveness of the SMS and the delivery of it through their operational activities (i.e. for the RU the operation of the train and for the IM the control of the infrastructure).

4. RESPONSIBILITIES IN THE FIELD OF OPERATIONS AND TRAFFIC MANAGEMENT

4.1 Infrastructure Manager and Railway Undertaking

According to Article 4 (3) of the Safety Directive, *the responsibility for the safe operation of the railway system and the control of risks associated with it shall be placed upon the IMs and RUs*, and not upon the National Safety Authorities. IMs and RUs are required to identify the risks, implement necessary risk control measures, apply national safety rules and standards and establish safety management systems.

This clearly indicates that the IM and RU have to apply the relevant rules and standards; but the existing legislation is not enough to ensure safe operation. In addition to this, the IM and RU should take an overview of the rail system and identify interfaces; between IM and RU as well as between different functions, job profiles and people within their organisations. All processes and procedures should be organised and defined, taking care of these interfaces between different functions, be it within their company or in connection with partners (driver – on-board staff, driver – signaller, signaller – switch guard, etc.). The development and implementation of these tasks results (under the application of the SMS) in the operational rules and procedures.

However it must be understood that, although several interfaces exist and must be covered by a common approach, the IM and RU are separate companies, each one responsible for its own field of business. The SMS provides a tool for the RU and IM to adapt the requirements to their individual operational needs.

4.2 National Safety Authority

One of the NSA's tasks is the *issuing and renewal of safety certificates and of safety authorisations* (Article 16 (2) g of the Safety Directive). Article 9 and annex III set out the requirements for the Safety Management System; its assessment is one of the prerequisites for obtaining a safety certificate or authorisation. EC Regulations 1158/2010 and 1169/2010 set out how the NSA should assess applications from RUs and IMs.

This means for the TSI OPE that the NSA should assess if the TSI OPE is taken into account in the IMs' and RUs' SMS in the way required by the MS's implementation plan. Furthermore it means: if the TSI OPE requires a certain procedure to be put in place, the IM or RU are free to choose the most appropriate way for its own organisation.

The assessment requirement of the SMS is followed by the NSAs supervising that the IM or RU-internal rules are applied as described in the SMS. For more information on SMS-assessment please see the recommendation on:

- CSM on conformity assessment – EC Regulations 1158/2010 for RUs and 1169/2010 for IMs;
- The SMS guidelines;
- CSM on Supervision – EC Regulation 1077/2012.

5. EXPLANATIONS ON SPECIFIC CLAUSES OF THE OPERATION AND TRAFFIC MANAGEMENT TSI

5.1 Working conditions and professional requirements

Although the TSI OPE does not describe in detail the working conditions and professional requirements, these should be taken into account by the IMs and RUs in their SMS, specifically the requirements for a competence management system.

Some topics that need special consideration include:

- Professional competences for drivers (see Directive 2007/59/EC):
  - Language competence (see Directive 2007/59/EC);
  - Rules knowledge;
  - Route / Infrastructure knowledge.
- Responsibility for the staff:
  - Health and Safety at work including respect of working time rules (like Directive 89/391/EC on the introduction of measures to encourage improvements in the safety and health of workers at work and Directive 2005/47/EC);
  - Medical requirements.

Several of these topics are covered by other European or national legislation which is not specific to the railway sector but has to be applied.

IMs and RUs should consider their own staff as well as subcontracted staff when drafting operational rules and applying the Safety Management System. Additional legislation like Council Directive 2005/47/EC on working conditions of mobile workers engaged in interoperable cross-border services in the railway sector of 18 July 2005 have to be taken into account.

In point 2.2.1, the TSI OPE makes reference to mutual recognition between Member States for requirements on professional qualifications as well as on health and safety conditions. This means that the staff fulfilling the requirements in one country should be accepted to operate also in the other country as long as staff is covered by the competence management system of the respective railway undertaking.

The scope specified in point 2.2.1 can be summarised in the tables below:

Staff involved with the working of trains that will cross-state borders and proceed beyond the frontier location

Task	Professional Qualifications	Health and Safety conditions
Accompanying a Train	4.6	4.7
Authorising Train movements	Mutual recognition	Mutual recognition
Train Preparation	4.6	Mutual recognition
Train Despatch	Mutual recognition	Mutual recognition

Staff working trains that do not cross state borders or do so as far as frontier locations

Task	Professional Qualifications	Health and Safety conditions
Accompanying a Train	4.6	4.7
Authorising Train movements	Mutual recognition	Mutual recognition
Train Preparation	Mutual recognition	Mutual recognition
Train Despatch	Mutual recognition	Mutual recognition

A distinction is made in TSI OPE between auxiliary staff and fully trained member of the train crew (either train driver or other train crew member performing safety-critical tasks). The auxiliary staff, if any, referred to in 4.6.4 are not part of the train crew and, as such, are not in the scope of chapters 4.6 and 4.7. However, they shall be trained to respond to the instructions of the fully trained member of the train crew which means that they can take part in some safety-critical tasks as, for instance, helping in the evacuation procedure under the control of the fully trained member of the train crew.

Guidelines in the definition of the assessment process of staff

In 4.6.3.1 of TSI OPE, RUs and IMs are required to define the assessment process for their staff. In this process, RUs and IMs should take into account each of the following:

A. Selection of personnel

- evaluation of individual experience and competence;
- evaluation of individual competence in the use of any required operating language(s) or the aptitude to learn them.

B. Initial professional training

- analysis of training needs;
- training resources;
- training of the trainers.

C. Initial assessment

- basic conditions;
- assessment programme, including practical demonstration;
- qualification of the trainers;
- deliver a certificate of competency.

D. Competency retention

- principles for retention of competency;
- methods to be followed;
- formalisation of the competency retention process;
- assessment process.

E Refresher training

- principles for on-going training (including language).

Guidelines on the hearing requirements

In chapter 4.7.3.3, the following values concerning the hearing requirements are given as guidelines:

- The hearing deficiency must not be higher than 40 dB at 500 and 1000 Hz;
- The hearing deficiency must not be higher than 45 dB at 2000 Hz for the ear with the worst air conduction of sound.

Knowledge on passenger safety (point 2.5 of Appendix F)

In 2.5 (b) of Appendix F, the verb identify is used. In this context, it means the capability to describe the identification and memorisation of context, to perform tasks and to solve problems in a defined frame.

In 2.5 (c) of Appendix F, it is required that the training on passenger safety covers some behavioural skills. Some elements that should be taken into account for the training of each single behavioural skill are described below.

Situational awareness should take into account the following:

- Attention to details;
- Overall awareness;
- Maintain concentration;
- Retain information;
- Anticipation of risk.

Conscientiousness should take into account the following:

- Systematic and thorough approach;
- Checking.

Communication should take into account the following:

- Listening (to people not stimuli);
- Clarity;
- Assertiveness;
- Sharing information.

Decision making and action should take into account the following:

- Effective decisions;
- Timely decisions;
- Diagnosing and solving problems;
- Calm under pressure.

In case there is no accompanying staff on-board the train performing safety-critical tasks, the train driver should be able to perform the tasks related to 2.5 of Appendix F in accordance with the train driver's certificate.

5.2 Operational documentation

One of the key members of staff who need specific information on train operation is the driver. They need a set of different documents; each of them with its own purpose and scope.

The ***Rule book*** includes all necessary operational rules and procedures that the driver has to know and to apply.

To ensure that the driver can apply the rules correctly, he must also be informed about the route characteristics. The route characteristics are set out in the ***Route book***.

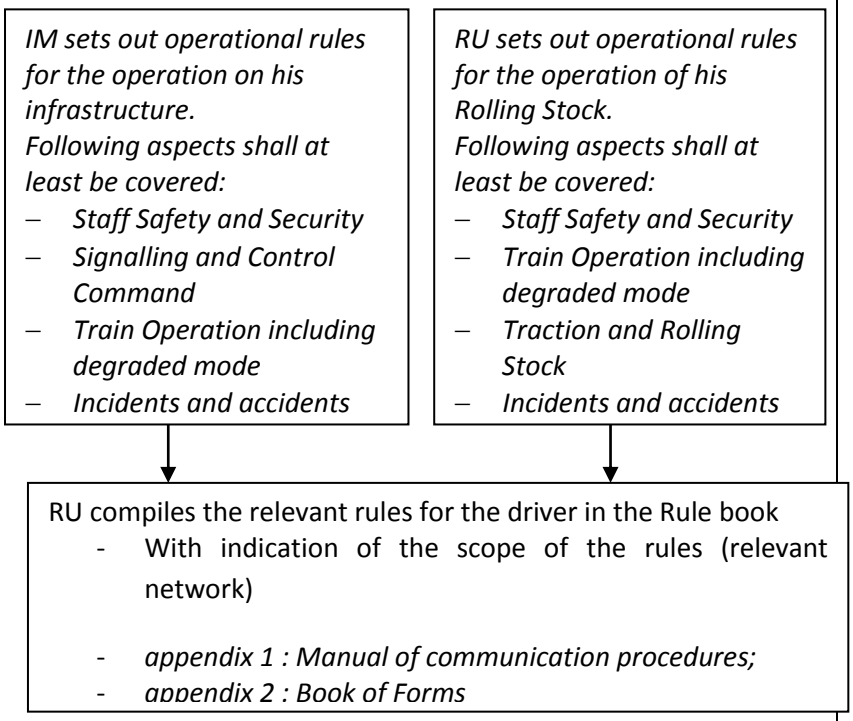
As the route characteristics may change due to planned works, the driver has to be informed by his RU – based on the information delivered by the IM responsible for the line. This could be considered in fact as an update of the Route book. The requirements are set out in the TSI-section "***Modifications to Information contained within the Route book***". It does not replace the operational procedures (e.g. in degraded mode) like written orders. If a change occurs in the route characteristics (i.e. due to works or to technical failures or incidents) and the information process for the modifications to the Route book cannot be used, the IM (signaller) has to inform the driver directly. The requirements are set out in the TSI as *"informing the driver in real time*". Such information must be understood as "*on time update of the Route book information*". It does not replace the operational procedures (e.g. in degraded mode) like written orders.

In addition to the documents mentioned above the driver must be equipped with the book of forms, including templates for all written orders and other documents he might need to fill in during the train journey.

Object	Rule book
Reference in TSI OPE	*4.2.1.2.1 Rule book*
Clarifications	a) It must be taken into account that a "standard" language for operations has not been suggested, so the driver must have language competency for the operating language used on all the lines the driver runs on.

b) Ensuring the language competency must be part of the RU's competence management system. It must take into account the RU's internal assessment about driver's language competency and the internal competence management system – like training the driver in the foreign language instead of translating the operational rules or training the drivers in the driver's mother tongue and provide translation tables or explanations or bilingual documents.

c) The content of the Rule book is not limited to topics mentioned in the TSI. The RU must assess all operational procedures and processes needed to prepare and operate the train.



The requirement that the rules are presented in a clear format is mandated so as to ensure that drivers are presented with the different rules for the various networks in a consistent manner. This is particularly important as the driver should be able to find easily the rules relating to the similar situations the driver may encounter on the different infrastructures on which the driver is running.

The SMS Guidelines advises that as a general principle, organisations should ensure that key operational information (including the drivers rule book) is:

- complete,
- appropriately updated,
- controlled,
- consistent and easy to understand (incl. the language used),
- staff are aware of its existence before it must be applied,

	• easily accessible to staff and where required copies are formally given to them. A method to format and generate controlled document is to provide appropriate fields at least for: • unique identification number, • date, • responsible person for preparation, • responsible person for authorising the release (of the original document and of the following revisions), • list of revisions. When an RU operates on a different infrastructure where new or other rules apply he will need to consider applying the CSM on risk assessment (EC Regulation 402/2013) to the operational changes. This will include any changes required to the rule book and the effect it will have on the driver undertaking the different operation. The results of the risk assessment will then need to be applied, including considering how the format of the rule book will need to be adapted and/or changed to ensure that the driver can operate safely on the new route.
Interfaces to other Directives, Recommendations, TSIs, ...	The *Train drivers Directive [4] 2007/59/EC* should be considered when defining the relevant language competencies.
Interfaces to other documents (ENs, UNI, ...)	None

Object	Route book
Reference in TSI OPE	*4.2.1.2.2.1 Preparation of the Route book*
Clarifications	a) The following aspects need to be considered: • *information on the means of communications to be used: track to train radio, signal post phones*, ... a hierarchy of the contact media is required, especially for the case of degraded situations These are necessary to enable the driver to contact the signaller in the way required/intended by the IM for normal operation as well as degraded mode. When establishing this information, the signaller always has the lead responsibility in the conversation. The signaller should ensure that, depending on the driver's information about train identity (running number) and position, the driver is connected to the relevant signaller. This might involve referring the call to another signaller.

	b) It must be taken into account that a "standard" language for operations has not been suggested, so the driver must have the competency for all operating languages used on the lines he runs on. c) Ensuring the language competency must be part of the RU's SMS and competence management system. – see also the explanations on the Rule book. The railway undertaking is responsible for the complete and correct compilation of the Route book, for example, arranging for any necessary translation and/or providing explanatory notes. A list of elements that the IM has to deliver to the RU for the compilation of the Route book is listed in Appendix D of the TSI.
Interfaces to other Directives, Recommendations, TSIs, ...	The Train drivers Directive 2007/59/EC [4] EC should be considered when defining the relevant language competencies.
Interfaces to other documents (ENs, UNI, ...)	None

Object	*Route book*
Reference in TSI OPE	*4.2.1.2.2.2 Modifications to Information contained within the Route book*
Clarifications	When the IM becomes aware of necessary modifications to the information in the Route book, it has to decide 1. if these modifications must be introduced in due time in the Route book; or 2. its temporarily amending document by the RU; or 3. if the IM has to inform the driver in real time. The IM should inform the RU of any modifications as soon as practicable and the way would depend on the agreed timescale for such modifications between IM and RU.
Interfaces to other Directives, Recommendations, TSIs, ...	None
Interfaces to other documents (ENs, UNI, ...)	None

Object	*Timetables*
Reference in TSI OPE	*4.2.1.2.3 Timetables*
Clarifications	The minimum requirements on timetable information for the drivers are set out in this clause.

	It is important to highlight that the timetable may be combined with other information. One example is the indication of orders and permissions that are used instead of signals on a line without CCS-system as defined in TSI CCS (neither ETCS nor national Class-B-systems). Such a document is then to be understood as a combination of timetable, route book information and operational orders. Such a document must be established in such a way that it meets the requirements of the different types of documents. It is for example advisable to take the standard timetable format as a basis and to combine it with the operational orders and permissions in a specific column so that it is always in the same place on the documentation.
Interfaces to other Directives, Recommendations, TSIs, ...	None
Interfaces to other documents (ENs, UNI, ...)	None

Object	*Book of Forms*
Reference in TSI OPE	*appendix C, 8.Book of Forms*
Clarifications	In the context of a given situation, the IM shall decide whether the use of a form is appropriate. - Several copies of each form should be included in the Book of Forms and it is suggested that dividers should be used to separate the sections. The RU may include explanatory text relevant to each form and the situations covered in the drivers' Book of Forms. - The RU may add translations of the forms and associated information contained in the Book of Forms, if the RU thinks that would help the drivers both during training and in real-time situations. This depends on the RU's internal driver competence management system. The RU might decide to train the driver in the foreign language instead of translating the operational rules or to train the driver in the driver's mother tongue and provide translation tables or explanations or bilingual documents.
Interfaces to other Directives, Recommendations, TSIs, ...	None
Interfaces to other documents (ENs, UNI, ...)	None

5.3 Train characteristics

Object	Train visibility – front end indication
Reference in TSI OPE	*4.2.2.1.2 Train visibility*
Clarifications	Each train should be equipped with a front end indication formed by three white lights. The three white lights should form an isosceles triangle. The upper light may be above or below the windscreen. This requirement is a technical as well as a procedural requirement. As a technical requirement it is answered by a functional requirement for Rolling Stock in the respective TSIs RST. The TSIs RST apply only on new, upgraded or renewed Rolling Stock. Vehicles running on the front end of a train which do not comply with the TSIs RST might not have the three white lights on the front end. From an operational point of view a gradual transition from existing train front end signal (if different from the one defined in the TSI OPE) to the "new one" is possible and expected. The front-end light is supposed to: - optimise train detectability: for example, to track workers and those using public crossings (marker lights); - provide sufficient visibility for the train driver: for example, illumination of the line ahead, lineside information markers/boards, etc. (head lights) by night and during low light conditions; and - not dazzle the drivers of oncoming trains.
Interfaces to other Directives, Recommendations, TSIs, ...	See section 4.3 of TSI OPE to TSIs RST
Interfaces to other documents (ENs, UNI, ...)	

Object	Train visibility – rear end indication
Reference in TSI OPE	*4.2.2.1.3 Train visibility*
Clarifications	a) Passenger coaches at the end of a train and train sets should be equipped with (at least) two steady red lights on a horizontal axis. This operational requirement is applicable for existing and for new Rolling Stock. For new, upgraded or renewed Rolling Stock, the detailed requirements on luminosity are stipulated in the RST TSI.

	b) The requirement for train rear end indication for freight trains is not yet harmonised in Europe. In some countries, lamps are required; in others (reflective) plates are used. However, the TSI OPE allows the MS to require for freight trains crossing a train rear end signal of either specified 2 steady red lights or 2 reflective plates. The MS has to indicate the device that is applicable on its network. However, the lamps should be accepted in the MS where plates are mandated. The plates should be accepted in the MS where lamps are mandated if the two cumulative conditions specified in TSI OPE are respected on the whole network. These two cumulative conditions are applicable only in MS where the 2 steady red lights are mandated. Even though, there is no harmonisation to one device, this requirement should improve interoperability. In Finland, no train rear end signal is considered necessary for domestic freight trains.
Interfaces to other Directives, Recommendations, TSIs, ...	TSI WAG revised
Interfaces to other documents (ENs, UNI, ...)	

Object	Train audibility
Reference in TSI OPE	*4.2.2.2 Train audibility* *The ability to sound the audible warning device must be possible from all driving positions.*
Clarifications	The driving position depends on the design of the driving cab as agreed between keeper and manufacturer.
Interfaces to other Directives, Recommendations, TSIs, ...	See TSI OPE , section 4.3 to TSI RST
Interfaces to other documents (ENs, UNI, ...)	

5.4 Train composition and preparation

The requirements on train composition are set out in point 4.2.2.5 of the TSI OPE. These requirements take into account those of point 4.2.2.7 which requires the RU to ensure that the train is fully functional before and throughout the train run. The RU should ensure that all vehicles as well as the combination of vehicles to a train or a train set fulfil all requirements regarding safety and the route that the train is operated on. This includes not only the vehicles themselves, but also the load of

freight and securing the load on or in the vehicle. A list of elements necessary for the verification of the train's compatibility with the route is listed in Appendix D.

Some of the measures are carried out by RU itself, for some the RU subcontracts other players like keepers, Entities in Charge of Maintenance (maintenance of the freight vehicles) or even the IM (e.g. maintenance of vehicles, train departure procedures). But even by subcontracting some of the tasks to other players the RU has the responsibility according to Article 4 (3) of the Safety Directive to manage the risks of their operation. They should therefore cooperate with subcontractors or those undertaking tasks which could affect the safety of the train and ensure that everyone is aware of their individual responsibilities and discharge them effectively.

Object	Train composition
Reference in TSI OPE	*4.2.2.7.1 General requirement*
Clarifications	The following aspects need to be considered: a) The train composition should be planned in advance in advance in order to **check the conformity with the path ordered** or to request another path suitable for the train. Therefore the RU should indicate general characteristics that influence the choice of routes as well as other constraints (like gauge, vehicle's speed limits etc.). b) The actual train composition should always be so that the train may run **on the routes** planned. This includes aspects like train length, gauge, axle load, accepted braking systems, braking performance, CCS-equipment on board and others. If the characteristics differ from those indicated to the IM, the RU has to inform the IM about this. If necessary, a new path may be allocated or the allocated path amended (commercial aspects are not subject of the TSI and therefore not covered) (see also Appendix D). c) For each train the RU should ensure that they know the **train composition** during the whole train run. This is necessary to cope with all possible risks that may arise during the train run. The IM must be informed about specific details of the train.
Interfaces to other Directives, Recommendations, TSIs, ...	Directive on train path allocation 2012/34/EC Directive 2008/68/EC of 24 September 2008 on the inland transport of dangerous goods
Interfaces to other documents (ENs, UNI, ...)	UIC-leaflet 421

Object	Braking performance
Reference in TSI OPE	*4.2.2.6.2 Braking performance and maximum speed allowed*
Clarifications	Due to its complexity it is described in more detail in chapter 6 of this application guide
Interfaces to other	

documents (ENs, UNI, ...)	

5.5 Safety of load and passengers

Object	4.2.2.4. Safety of passengers and load
Reference in TSI OPE	*4.2.2.4.1 Safety of load*
Clarifications	The Railway Undertaking should make sure that vehicles are safely and securely loaded and remain so throughout the journey. The RU should consider the following aspects: Weight distribution Vehicles should be loaded so as to evenly distribute the weight of the load over all the axles. Where, due to the size or shape of a particular load, this is not possible the RU should apply special conditions of travel to the load for the entire journey. Axle loading The Railway Undertaking should ensure that vehicles are not loaded beyond their axle load limit. They should also ensure that vehicles are not loaded beyond the axle load limit of any part of the planned route (unless the IM(s) concerned have authorised the movement). Load securing RUs should ensure that loads and any unused load securing equipment on or in vehicles are secured in a safe manner to prevent unnecessary movement during the journey. Kinematic envelope The kinematic gauge of each vehicle (inclusive of any load) in the train should be within the maximum permissible for the section of route. Load covering RUs should ensure that any materials used to provide a cover for a load on a vehicle are safely attached either to the vehicle or to the load. These coverings should be made of materials that are suitable to cover the load in question taking in to account the forces that are liable to be experienced during the journey. Dangerous goods The legislation on dangerous goods should be applied.
Interfaces to other Directives, Recommendations, TSIs, ...	TSI INF Directive 2008/68/EC of 24 September 2008 on the inland transport of dangerous goods
Interfaces to other documents (ENs, UNI,	Examples: UIC-leaflet 700

...)	GCU Art. 29

5.6 Train identification

Object	Train identification
Reference in TSI OPE	*4.2.3.2 Identification of trains*
Clarifications	The TSI OPE requires that each train should have a unique identification. The standard means for this is the train running number. Due to existing CCS-systems and other IT-systems the total number of train running numbers is limited; the numbers must be re-used on the European network. To ensure that trains can be correctly identified, each train running number should be unique per network. In this case it means not only rail network, but also the IT-networks of e.g. GSM-R and ETCS. If the IT-systems have another geographical extent than the rail network, the different extents must be compared. The largest extent must be considered when assigning the train numbers. If, for example, two IMs decide to establish one common GSM-R network, then the IMs would have to ensure that a train running number is not repeated on the network of the other IM because they operate on the same GSM-R network. The train running number is allocated by the IM allocating the train path. In doing so, he should cooperate with other IMs to ensure that the number is not re-used unnecessarily. Furthermore the IM should ensure that all affected parties (RU and other IMs) are informed about the allocated train number and possible changes. Changes of the train running number should be avoided as much as possible. If a change is necessary, the IM should inform the RU and other IMs about the change. If really necessary, then the change of a train running number should take place while the train is at standstill because data entries need to be done by the driver, and clear addressing by signaller and others should be possible during the train run.
Interfaces to other Directives, Recommendations, TSIs, ...	
Interfaces to other documents (ENs, UNI, ...)	One of the possible supports is UIC-leaflet 419

5.7 Train run

Object	Train ready message
Reference in TSI OPE	*4.2.3.3.2 Informing the IM of the train's operational status*
Clarifications	The TSI requires that the RU informs the IM when a train is ready to access the network and to start its train run.

	This requirement includes the possibility that IM and RU agree beforehand that a train is ready at the moment of departure when the RU does not indicate the contrary. It must be understood that such agreement needs to be concluded between IM and RU to ensure efficient use of the infrastructure. Three different steps must be differentiated: a) Train path allocation: The operator of the train must obtain a train path. The request for a path as well as the allocation has to be done under the rules applying the "Directive on allocation of paths and the levying of charges" 2012/34/EC. b) Train operation: Train operation starts when the train path has been allocated. The train operation includes the preparation of the train and the train running. The operation of the train is in the scope of the TSI OPE. The TSI OPE defines the interfaces between IM and RU to ensure that both operate the train on a common understanding of their different responsibilities. c) Train run: The train run starts with the train ready information (according to point 4.2.3.3.2) at the point of origin (first point of the path contract) and ends with the arrival at the termination point (last point in the path contract).
Interfaces to other Directives, Recommendations, TSIs, ...	
Interfaces to other documents (ENs, UNI, ...)	

Object	Train reporting
Reference in TSI OPE	*4.2.3.4.2 Train reporting*
Clarifications	The train reporting includes several requirements on train position reporting and hand over time. These requirements set out the kind of information that is necessary for efficient and effective train operation in order to allow smooth train runs in the interest of all RUs' customers – passengers and freight customers. The amount of reporting points and the means of reporting should be adapted to the operational needs for efficient operation on each line and its traffic. A freight corridor at the limit of its capacity probably requires other reporting protocols than a line with three freight trains per day

	(although the freight RU's customer might still have very high requirements on the reporting – depending on the business case for those transports). One way of communication may be the Telematic applications that are necessary following the TSIs TAF and TAP; but the TSI OPE does not require Telematic applications. In the interest of smooth operation it may be necessary to consider also other ways of communication like telephone or other means.
Interfaces to other Directives, Recommendations, TSIs, ...	
Interfaces to other documents (ENs, UNI, ...)	

Object	Data recording
Reference in TSI OPE	*4.2.3.5 Data recording*
Clarifications	The information recorded should be at least accessible to the NIBs. However, at national level, some other "authorised bodies" might be given the right to access these data. The precise geographic location should precise a distance in kilometres from a recognisable location.
Interfaces to other Directives, Recommendations, TSIs, ...	Safety Directive [2] TSI LOC&PAS
Interfaces to other documents (ENs, UNI, ...)	

Object	Data recording
Reference in TSI OPE	4.2.3.5.1 Recording of supervision data outside the train
Clarifications	TSI OPE requires first of all that certain data is recorded. This should be seen in connection with the principle that TSI OPE requires what shall be done and not the technical way of how to do it. On existing lines the recording may take place by hand-written documentation. The assessment of risks associated with the procedures and the possible need for technical equipment (for existing lines) is a task of the IM. Besides, the recording of safety related communications between train driver and signaller should not be understood as a technical requirement to split between safety and not safety related communication.
Interfaces to other	Safety Directive [2]

Directives, Recommendations, TSIs, ...	
Interfaces to other documents (ENs, UNI, ...)	

Object	Data recording
Reference in TSI OPE	4.2.3.5.2 Recording of supervision data on-board the train
Clarifications	There are a number of data to be recorded on-board the train which includes *"detection by on-board alarm systems related to the safe operation of the train, if fitted".* An example of on-board alarm systems also covers hot axle box detector. These on-board alarm systems exclude passenger alarms which are not specific to the control of operational safety. RUs are invited to make use of the recorded data within their monitoring while respecting legislation on data protection.
Interfaces to other Directives, Recommendations, TSIs, ...	Safety Directive [2] TSI LOC&PAS
Interfaces to other documents (ENs, UNI, ...)	

Object	Sanding
Reference in TSI OPE	*Appendix B, Use of sanding.*
Clarifications	The application of sand is an effective way of improving the adhesion of wheels to the rail, to aid braking and starting away especially in conditions of low/poor rail adhesion. A build-up of sand on the railhead may cause a number of problems especially in connection with the activation of track circuits and the effective operation of points and crossings. This should be taken into account in the IM's operational rules and the Driver's rule book.
Interfaces to other Directives, Recommendations, TSIs, ...	TSI CCS
Interfaces to other documents (ENs, UNI, ...)	

5.8 Line side characteristics

Both the RU and IM have responsibilities in relation to line side characteristics. Most of the requirements in the TSI are quite clear and do not need additional explanation.

Object	Line side Signals and markers
Reference in TSI OPE	*4.2.2.8* Requirements for lineside signal and marker sighting
Clarifications	One of the important questions when designing and installing line side signals and markers is the detailed placing of the signals. The decisions that need to be taken into account include: Lineside markers, signs and information boards should: • Be suitably sited so that train headlights allow the driver to read the information, • have suitable intensity of lighting, where required to illuminate the information, • for where retro-reflectivity is used, the reflective properties of the material used should be in compliance with appropriate specifications and the signs are fabricated so that train headlights easily allow the driver to read the information. This applies to lineside signals that need to be observed by the driver. It does not need to take into account speeds operated under cab signalling conditions; this reflection is covered in the TSI by “whenever applicable”.
Interfaces to other Directives, Recommendations, TSIs, ...	
Interfaces to other documents (ENs, UNI, ...)	

6. BRAKING PERFORMANCE AND MAXIMUM SPEED ALLOWED

6.1 Principles

Braking performance is a subject that concerns both the IM and RU. Point 4.2.2.6 of the TSI OPE clarifies the interface between IM and RU:

- Allocation of responsibilities,
- Communication related to braking performance.

In any case IM and RU have to work together and exchange information to ensure a safe operation of trains. IM and RU must ensure that the risks occurring at the interface between IM and RU are analysed and covered by operational rules and procedures in accordance to Article 9 (2) of the Safety Directive [2].

6.2 Responsibilities of the IM and RU

The IM should ensure that the correct and complete information concerning the line characteristics are given to the RU in a clear and usable format (e.g. RINF, Data file). The IM has to indicate to the RU the conditions of use of brake systems affecting the infrastructure (route related information). The IM should also provide route characteristics that the RU must take into account for establishing the necessary braking performance and corresponding maximum speed. This should cover e.g. steep gradients and signalling distances. The IM should also make available the measure potentially applicable for constraints that the RU has to respect if a train does not reach the necessary braking performance (either general measures or line related, as appropriate).

The RU establishes procedures for the train composition and for determining the braking capability of the trains and corresponding maximum speed to ensure that the trains run safely on the intended route. This should include normal and degraded mode operation. The procedures must take into account constraints like the availability and reliability of the brakes. The procedures must also take into account train running characteristics like longitudinal forces (and associated risks of coupler breakage). These general procedures established by a RU may be the same for all networks the RU is running on as the train characteristics and behaviour does not change by passing a border (exception: considerable changes in climatic conditions for instance) – the necessary braking performance may however vary from route to route (e.g. due to different gradients, or to different signalling distances).

With information provided under point 4.2.2.6.2 (1) of TSI OPE, the RU may perform stopping distance calculations or may determine the necessary braking performance of the train by applying the code of practice such as the requirements for the necessary braking performance already in use on the intended route. The mentioned calculation or code of practice also takes into account the maximum speed allowed during operation.

In order to facilitate the procedure, next to the line characteristics defined in point 4.2.2.6.2 (1), the IM may provide the expected rolling stock minimum braking performance taken into account for the line at design stage and ensuring the compatibility of the rolling stock with the line at its maximum operating speed. This minimum braking performance requirement is expressed in deceleration profile and equivalent response time on level track or brake weight percentage depending on the maximum

speed and composition of train as referred to in point 4.2.2.6.2 (2). By using this information, the RUs may calculate the required braking performance for larger parts of the network and calculations of the required stopping distance for each individual line may be avoided. When the IM provides the expected RST minimum braking performance, the RU has to express the braking performance using the same unit, and each party is responsible for this interface parameter expressed in that unit.

For the train braking performance based on brake weight percentage, the most common formula for conventional rail is intended to provide a simple way to evaluate the braking performance of a train composed of various vehicles and is the following:

(Sum of brake weight including locos x100) / (Sum of total weight of the train including locos) = Brake weight percentage

Notes:
(1)The sum of brake weight is performed over the brake weight of active brakes only. The brake weight of each vehicle is determined when the vehicle is placed in service.
The sum of total weight is the actual or estimated (higher) weight (mostly written on the vehicle).
(2) This formula is considered as a code of practice; most of the existing braking tables are based on brake weight percentage, and can therefore also be considered as codes of practice.
However, any change in these braking tables should be assessed by the IM and by the RU (in case of change due to rolling stock characteristics) using the CSM on risk assessment to maintain the safety level in case of evolution of braking tables.

The procedures the railway undertaking should set up and implement are related to e.g.:

- the composition of trains and;
- the determination of the actual braking performance.

These procedures shall be managed by the RU within its safety management system using the CSM on risk assessment.

6.3 Procedures

6.3.1 Preparation

- The IM details the information necessary for the calculation of the necessary braking performance for all routes. The IM makes this information for necessary braking performance available to the RUs. The IM also indicates related information like the conditions of use for brake systems that can impact the infrastructure like eddy-current, magnetic or regenerative brake. This results from point 4.2.2.6.2 (1).
- The IM may also deliver the existing requirements on expected rolling stock minimum braking performance, if they are available, to the RUs. If the IM decides to do so, this information should be made available to all RUs who intend to operate trains on the specified route of its network. This results from point 4.2.2.6.2 (2).
- The RU establishes procedures for determining the braking capability of the train at corresponding maximum speed and for train composition taking into account the line characteristics provided by the IM (included the maximum line speed related to the infrastructure). This results from point (3) of 4.2.2.6.2.

Note: The actual braking performance resulting from the checking of the actual train (train composition, brake availability, train length, train weight, brake settings…) will be used as an input value for any operation rule to be subsequently applied to the train. This means that the result of the calculation should be used as such (e.g. brake weight % to be used as calculated; ranges in a table may be derived as written without further deduction). The decision about the brake setting to use (e.g. P or G or combination of brake systems) for a train is then up to the RU, taking into account the relevant train characteristics such as length, type of couplers, etc. However, the necessary braking performance must at least be achieved.

6.3.2 Train prepared to run

The RU calculates the actual braking performance for the individual train prepared to run and verifies that this actual braking performance matches or exceeds the necessary braking performance determined for the associated train path.

The RU must not take into account any brake system that is not allowed to be used on the given route.

6.3.3 Braking performance insufficient during operation

If during operation the actual braking performance does not meet the necessary braking performance determined at planning stage, the train may have to run at a lower speed than authorised for the relevant route. In this situation, the RU should inform the IM immediately and take appropriate measures (like reduction of speed) and the IM may take appropriate measures to reduce the overall impact on the traffic on its network.

The rules may be designed as one set of rules valid for the whole network or as route-specific rules.

In some cases, train operation will not be possible (according to the rules for reduced braking performance), either because of safety reasons (e.g. impossibility to halt a train on steep gradients) or for traffic management reasons (traffic disruption due to the resulting speed limit). In these cases a possibility is a request for an ad hoc path in accordance with the actual braking performance achieved by the individual train.

6.4 Establishing operational rules

6.4.1 Safety Management System

It is vital to ensure that consistent operational procedures are applied in all cases. This means that all rules and procedures must be managed by the IM's and RU's Safety Management System. Whether a rule is appropriate or continues to be appropriate is a key requirement of the risk assessment process as set out in the RU/IM SMS. The results of the risk assessment will determine what control measures are needed in order to ensure that the risk is managed. The RU/IM will need to regularly ensure that the rules remain effective in controlling the risk and updating them as and when required. For any operational changes, the CSM on risk assessment should be considered. Further information on this is set out in the CSM Guidelines.

6.4.2 Application of existing rules

Experience shows that railways have operated in a safe manner for a long time with the existing braking performance rules.

If an RU operates in or across one or more Member States, the RU may decide to take over existing rules from another entity (example: in different MSs the IMs have managed these rules before).

If the RU applies existing rules they need to consider the application of the CSM on risk assessment in relation to an operational change.

6.4.3 Establish new / amend existing rules

If the RU decides to establish new rules or amend the existing ones, then they should consider the application of the CSM on risk assessment in relation to an operational change [7]. The technical parameters listed in EN 14198:2004 and EN 14531 as well as UIC-leaflet 544-1 should be taken into account for the risk assessment.

Technical development should not be hindered. If technical devices improve the braking performance on train level, the RU shall be allowed to take this improvement into account. Also such a decision shall be covered by a risk assessment.

6.4.4 Elements specific to ETCS

First of all, it must be understood that the requirements of TSI OPE and the braking values for ETCS are used in different steps of the whole procedure for running a train.

TSI OPE sets out the rules on the information exchange between IM and RU before running a train, so in the planning phase. This also applies in the case of ETCS.

ETCS on the other hand affects the braking and braking performance of a train while running this train. Based on the value for the achievable braking performance of the train, the deceleration profile is calculated on board and applied accordingly. Here an exchange of values takes place between the CCS-components on the track and the CCS-components on board. Therefore a common unit for ETCS is important. The relevant value is the speed dependent deceleration profile and the brake build up time. Acknowledging the necessity of the deceleration value for ETCS, the system allows the use of deceleration values as well as of brake weight percentage as input data thanks to its on board conversion model for the input of brake weight percentage.

7. Common operational principles and rules (Appendix B)

Appendix B sets out the Common Operational Rules (COR) which should be used following the scope of TSI OPE and in the prescribed situations. They are valid for both ETCS and class B systems. In other words, it means that these COR are applicable regardless the CCS system used. They have been developed using a risk assessment process in that a hazard was identified and the potential risk analysed. The situation protocol for each of the events is included in this application guide. The situation protocols were then used to decide what the most appropriate high level controls should be applied to control the risk. These are called Common operational rules and should be applied in the event of a situation occurring.

In Member States where a rule is in place relating to the identified situation which deviates from the principles in the COR, the RU/IM needs to analyse the results of the change using the CSM on risk assessment. If a result of the analysis determines that the COR cannot be applied, the RU/IM needs to demonstrate this analysis and the alternative approach using the CSM on risk assessment. If the CSM on risk assessment is applied, this decision to use a different rule should be verified by an independent safety assessment and consideration given as to whether there is a need to review or add new CORs to the TSI.

For all the rules developed, ERA, in order to have the same basis to carry on the works, assumed that:

- All members of railway staff apply the rules correctly.
- All other technical equipment works correctly.
- The train radio is installed.
- The Signalling system is the national one.

Any detailed instructions given by the signaller to the driver on how to deal specifically with the event will be complimentary to the COR.

Appendix B will be developed further over time and include more situations where it is possible to agree a European COR.

Some rules contained in Appendix B have been transferred from Appendix A. These rules have not been covered with a situation protocol but explained in the paragraphs below:

<u>Departure of the train</u>

In the case of ETCS, the analysis below shows that all cases of departure after an exceptional stop are covered by an operational rule.
a) Circumstances that can lead to an exceptional stop:

- brakes are triggered automatically:
    - Trip,
    - Service Brake,
    - Emergency Brake,
- brakes are triggered manually:
    - by the driver,

    - by anyone on the train,
- EOA,
- by rule:
    - e.g. ETCS stop marker,
    - written order.

b) There is no need for a rule because all situations above are already covered by other rules:

- train trip: rule “Responding to a trip”,
- awakening: rule “Putting the on-board system into service”,
- emergency stop: rule “Responding to a trip”, or rule “Taking measures in event of an emergency”,
- revocation of MA: rule “Revoking an authorisation for train movement”,
- time out: rule “Responding to a trip”, or rule “Authorising the passing of an EOA”.

In the rule it is stated that:
“At the initial station or after a scheduled stop the driver is allowed to depart when the following conditions are fulfilled:

- *After the driver has received an authorisation for train movement; and*
- *After train service conditions are fulfilled; and*
- *When it is time to depart, except when allowed to start before the scheduled time.”*

It should be clear that the first bullet point is in the perimeter of the IM while the second and third bullet points are in the perimeter of the RU.

In addition, it is recommended that a single ETCS operational train category should be assigned to a train at the start of the journey which should be maintained to its final destination.
Explanations:

- the Kappa correction factor is not used;
- if this recommendation is fulfilled there is no need for a change of the brake position during the journey.

<u>Complete failure of the front end lights</u>

In both situations, when the visibility is good or when the visibility is poor/darkness, the driver shall proceed to the nearest location at the maximum permitted speed to the nearest location where the front end light can be repaired/replaced or the affected vehicle replaced. The maximum permitted speed should not be understood as the maximum permitted speed in general but as the maximum speed that should be adopted in the situation of a complete failure of the front end lights. This speed might be given either by the signaller or by a non-harmonised rule.

Running on sight

In the case of ETCS, this rule is not restricted to running in OS mode; it also applies when the driver has to run on sight for other reasons, e.g. running in FS with a written order requiring running on sight, etc.

Emergency call

The operational rule referring to the emergency call takes as assumptions the following:

- the operational situations in which a performer shall trigger the emergency call are covered by non-harmonised rules,
- the harmonised rule starts from the moment an emergency call is received,
- the first action of all the drivers after receiving an emergency call is to do everything in order to reduce potential consequences,
- in such a situation all concerned drivers are listening to the communications, avoiding to speak unless they have to give new relevant elements,
- the signaller communicates with drivers to provide additional instructions or information,
- after receiving an emergency call the actions performed by the signaller shall be part of the non-harmonised rules,
- only the signaller is allowed to revoke an emergency call,
- only the signaller can decide when to resume normal operation,
- no special rule is needed for non-stopping areas and safe areas.

Immediate actions to prevent danger to trains

It should be explained which immediate actions are expected from the driver when a signal is put at danger, in case of ETCS level 1 (cab signalling), and that cab signalling does not exonerate the driver from observing the line for safety purposes as far as practicable.

8. Safety related communications methodology (Appendix C)

Appendix C enables the infrastructure manager to draw up the messages and books of forms. These elements should be addressed to the RU at the same time as the rules and regulations are made available. These are then used by the IM and the RU to draw up the documents for their staff (Books of Forms), instructions for signallers and Appendix 1 to the Driver's Rule Book 'Manual of communication procedures'.

The extent to which forms are used and their structure may vary. For some risks the use of forms will be appropriate, whilst for others it will not be appropriate.

The following is an example of the use of the International Phonetic Alphabet, decimal points and numbers:

Signal Number KX 835 = Signal Kilo X-Ray eight three five

Points A B = points alpha bravo

The IM may add further letters, along with a phonetic pronunciation for each letter added, if required by the alphabet of the IM's operating language(s).

The expression should be given in local time, in plain language. It would be also acceptable, whenever necessary, for the time to be spelled out digit by digit.

One rule of Appendix A concerning written orders has been transferred to Appendix C. Written orders are a common method of dealing with failures and external conditions. The rules described build upon this method of communication and adapt them for effective use.

Examples of additional terms which may be required to support the Communication requirements in Appendix C

Messages sent either by the track workers or the driver

Need to stop all trains:
The need to stop all trains must be transmitted by means of an acoustic signal; if this is not available the following phrase must be used:

Emergency, stop all trains

Need to stop a particular train:

Emergency stop train …….. (on line/track) (name)

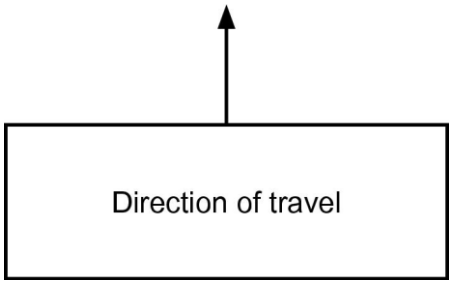
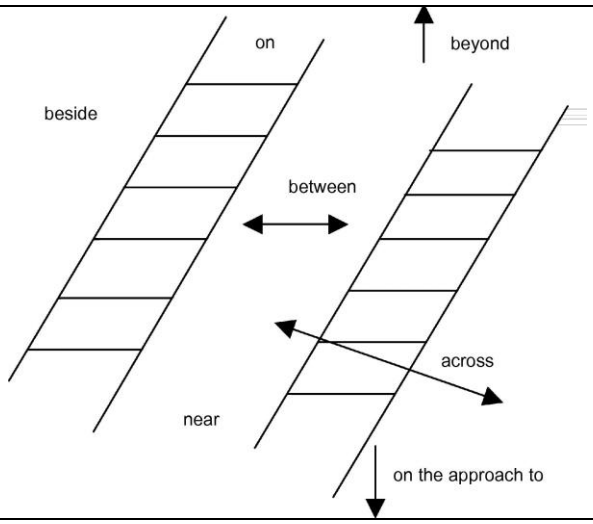
Information on location or area is, if necessary, specified in the message.
In addition, this message is to be quickly complemented, if possible, by the reason, and the train's identification.

Obstruction on or near the track
Or Fire on the train or near the track
Or …….. (other reason)
on line ……..at …… (name) (km)
Driver of train …… (number)

Guideline structure for messages

These messages may be structured along the following lines:

Stage in the communication flow	**Message element**
Reason for passing the information	†for information †for action
Observation	†There is I saw †I had †I hit
Position — along the line — in respect to my train	†at . . . . . .(station name) †. . . . . .(characteristic point) †at mile post/kilometre point . . . . . .(number) †power car . . .. (number) †trailer car . . . . . (number)
Nature — object — person	. . . . . . (see glossary)
State — static — moving	†standing on †lying on †fallen on †walking †running †towards

Location with respect to the tracks 	

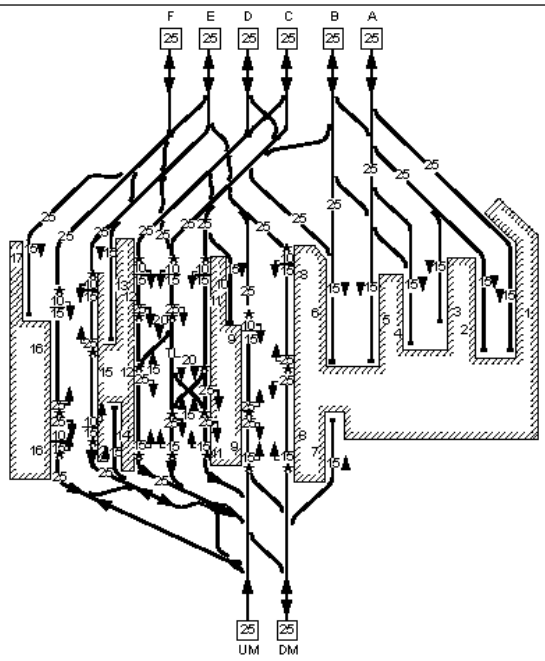
9. Elements the IM has to provide to the RU for the Route book and for the train compatibility over the route intended for operation (Appendix D)

Appendix D is composed of two parts. The first part relates to the information needed by the RU to compile the route book and that should be delivered by the IM. This part lists the elements necessary and should be read in relation with point 4.2.1.2.2.1 Preparation of the route book of the TSI.

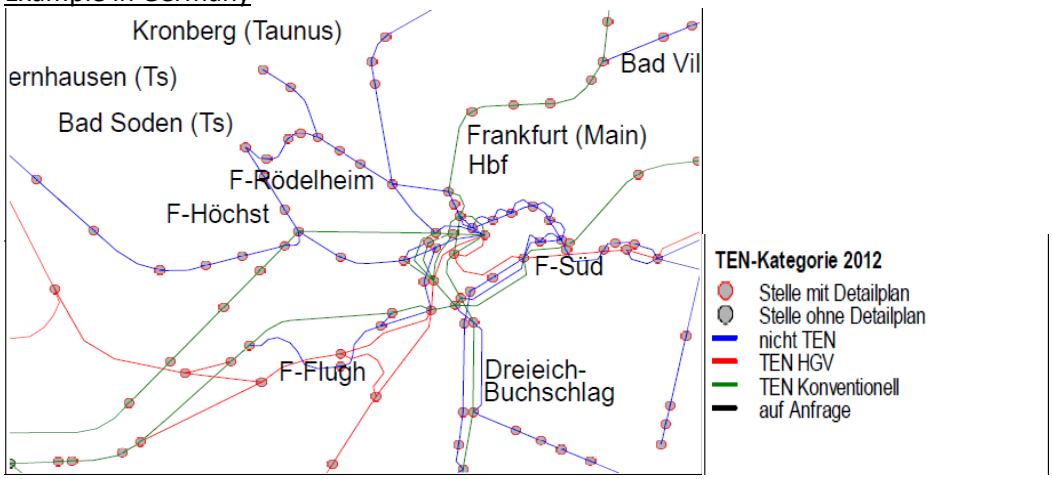
For the route book, maps and line diagrams should be given by the IM to the RU. Some examples of maps and diagrams are given in this application guide:

Example in the UK

LOR	Seq.	Line of Route Description	ELR	Route	Last Updated
LN836	008	Doncaster, Marshgate Jn. to Neville Hill East Jn.	DOL2 HUL4	London North Eastern	28/08/2012

Location	Mileage M Ch	Running lines & speed restrictions	Signalling & Remarks
LEEDS	185 64 * 185 65 * 185 66 * 185 69 * 185 70 *		NRN TCB York SB RA8 AC: York ECR 031
	20 50 20 48 * 20 47 *		A=A Line B=B Line C=C Line D=D Line E=E Line F=F Line
	20 45 *		PP- Permissive Working - platforms 1 to 7 & platforms 10, 13, 14, & 17 - full use for class 1, 2, 3 (ECS), 5, 9 &0 trains.
	20 42 * 20 39 * 20 36 *		PP is authorised in Platforms 8, 9, 11, 12, 15 and 16
			TL=Through Line
			15mph PSRs on Platform 11, Through Line, and Platform 12 in Up direction continue to 185mi 65ch, including over S & C
Leeds East Jn.	20 26		

Example in Germany



The second part aims at providing the RU with the information from the IM necessary for the RU to ensure the train compatibility over the route intended for operation. This part of Appendix D should be put in relation with the approved draft Commission Recommendation DV 29 bis (version EN06 dated 04.09.2014), RINF and the Network Statement. Indeed, this Commission Recommendation states that: under point 16, "to assess if the route will support a train, a railway undertaking compares the characteristics of a train composed of vehicles of certain types with the information provided by the infrastructure manager in the register of infrastructure. The obligation of infrastructure managers to make public the nature of infrastructure already exists […]. Until the register of infrastructure is established and populated, the infrastructure managers should publish this information in another form. This does not empower the infrastructure managers to impose a sort of second authorisation to the vehicles or trains of the railway undertakings. In addition, under point 78 and 79, it is stated that "Railway undertakings should find in the infrastructure register all information (on the nature of the infrastructure) which they need in order to establish whether the train they intend to run is compatible with the specific route (train/route compatibility). The infrastructure manager should describe in the infrastructure register for each parameter the nominal values and, where applicable, the limit values of the interface parameters to which the route section is maintained. The railway undertakings rely upon the integrity of this information to ensure the safe operation of their trains. The infrastructure manager should inform the railway undertaking of any temporary changes to the nature of the infrastructure not listed in the register of infrastructure. Once a railway undertaking has established, by using the infrastructure register and the technical file accompanying the 'EC' declaration of verification of the vehicle types , and considering the restrictions on the authorisation for placing in service of the vehicle, that the route can support the train it intends to run, it should then refer to the provisions of the TSI related to 'operation and traffic management' (particularly its sections relating to train composition, train braking and running order) to ascertain whether there are any train related restrictions inhibiting operation on the route (e.g. speed limits, length limits, power supply limits)".

Finally, Annex VI of Directive 2012/34/EU states that:

"The network statement referred to in Article 27 shall contain the following information:

1. A section setting out the nature of the infrastructure which is available to railway undertakings and the conditions of access to it. The information in this section shall be made consistent, on an annual basis with, or shall refer to, the rail infrastructure registers to be published in accordance with Article 35 of Directive 2008/57/EC."

The process could be summarised in the following manner:

- Phase 1: Strategic planning – The RU can consult the RINF in order to identify where its business can be performed and to design new trains and develop train services taking into account their respective intended routes;
- Phase 2: Ordering – The RU should request a train path using the procedure described in the Network Statement and the description of the "nature of infrastructure" included in the Network Statement is contractually binding;
- Phase 3: Preparing the train – Following the requirements of 4.2.2.5 on train composition, Appendix D and 4.2.3.3.1 on the tests and checks before departure of TSI OPE, the RU prepares its train;
- Phase 4: Train running – The driver should be informed in real time in case of deviations.

The updates of the RINF are made on a regular basis, and at least every three months (RINF decision 2011/633/EU). In order to enhance synergy between the Network Statement and the RINF, one update of the national register of infrastructure should coincide with the annual publication of the Network Statement. RINF and the Network Statement are complementary to each other and should be used in parallel by the RUs. Indeed, RINF will be consulted by the RU to verify the technical characteristics of the infrastructure and, while planning its operation, to make the preliminary checks between its rolling stock and the infrastructure. Based on the procedures set up in the Network Statement by the IM, the RU will request for the allocation of a path accordingly.

The list in Appendix D does not include optional functions for the RST as the IM cannot require the RST to be equipped with such optional functions (for instance, cold movement detection). Besides, these optional functions have been considered as outside of the scope of Appendix D as they do not affect the train compliance with the path.

10. EUROPEAN VEHICLE NUMBER (APPENDIX H)

Each vehicle must have a European Vehicle Number. The details on the EVN are set out in Commission Decision 2007/756/EC.

How the EVN and related markings (TEN or Authorisation plate) are painted on the vehicle, is set out in Appendix H of the TSI OPE.

Inscription of the number and linked alphabetical marking on the bodywork

This part states the basic requirements concerning the marking on vehicles. It must be seen in connection with the requirements of the relevant TSIs for Rolling Stock concerning markings on the vehicles.

Alphabetical *marking of the interoperability capability*

Vehicles which meet the following conditions should be marked with a "TEN":

1. It complies with all relevant TSIs which are in force at the moment of placing in service and which has been authorised to be placed in service according to Article 22(1) of Directive 2008/57/EC. And
2. It is provided with an authorisation valid in all Member States in accordance with article 23(1) Directive 2008/57/EC.

This means, that the relevant TSIs for Rolling Stock (including for example TSIs as Noise, People with reduced mobility (PRM)) have been fulfilled and the vehicle is cross-authorised).

Vehicles that are authorised to be placed in service according to the other procedures stipulated in Articles 21 – 25 of the Interoperability Directive [1] may not carry the marking "TEN".
They should carry an authorisation plate with the letter marking of the Member States where the vehicles are placed in service. The Member States' abbreviations shall be used according to part 4.

The marking PPV or PPW is not given by Member States of the European Union.