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ANNEX

ANNEX

to the

COMMISSION IMPLEMENTING REGULATION

amending Regulation (EU) No 1305/2014 as regard the simplification and improvement of data calculation and exchange and the update of the Change Control Management process

Implementation

1.

The Agency shall assess and oversee the implementation of this Regulation to determine whether the agreed objectives and deadlines have been achieved and shall provide an assessment report to the European Commission via Telematics Advisory Committee referred to in Section 7 of the Annex.

2.

The Telematics Advisory Committee referred to in Section 7 of the Annex shall assess the implementation of this Regulation, based on the assessment report provided by the Agency, and the information provided by the Representative Bodies about further actions to be taken by the sector. On this basis, it shall advise the European institutions about appropriate follow-up actions to be taken.

3.

Member States shall designate a National Contact Point for the follow-up of the implementation of TAF & TAP TSI Regulations as respectively described in TAF TSI Appendix III, and TAP TSI Annex VI.

4.

Each Member State shall ensure that a National Allocation Entity is appointed to be responsible for allocating unique location codes for each reference database and notifying all involved reference databases (e.g. Central Reference Database (CRD), Retail Reference Database (RRD)) of the update. Where appropriate, Member State may delegate so that one single National Allocation Entity takes the responsibility for all reference databases.

ANNEX

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1. INTRODUCTION

1.1. Abbreviations

Table 1

Abbreviations

Abbreviation	Definition
CI	Common Interface
EC	European Commission
ERA	European Union Agency for Railways (also referred to as Agency)
IM	Infrastructure Manager
ISO	International Organisation for Standardisation
LCL	Less than Container Loads
LRU	Lead Railway Undertaking
RISC	Rail Interoperability and Safety Committee
RU	Railway Undertaking
TAF	Telematics Applications for Freight
TAP	Telematics Applications for Passengers
TCP/IP	Transmission Control Protocol/Internet Protocol
TSI	Technical Specification for Interoperability
WK	Wagon Keepers

1.2. Reference Documents

Table 2

Reference documents

Ref. No	Document Reference	Title	Last Issue
(1)	Directive (EU) 2016/797	Directive (EU) 2016/797 of the European Parliament and of the Council of 11 May 2016 on the interoperability of the rail system within the European Union (OJ L 138, 26.5.2016, p. 44).	27.5.2020
(2)	TAP TSI Regulation (EU) No 454/2011	Commission Regulation (EU) No 454/2011 of 5 May 2011 on the technical specification for interoperability relating to the subsystem 'telematics applications for passenger services' of the trans-European rail system (OJ L 123, 12.5.2011, p. 11).	27.5.2019
(3)	Directive 2012/34/EU	Directive 2012/34/EU of the European Parliament and of the Council of 21 November 2012 establishing a single European railway area (OJ L 343, 14.12.2012, p. 32).	14.11.2017
(4)	ERA-TD-105	TAF TSI — ANNEX D.2: APPENDIX F — TAF TSI DATA AND MESSAGE MODEL.	
(5)	TAF TSI Regulation No 62/2006	Commission Regulation (EC) No 62/2006 of 23 December 2005 on the technical specification for interoperability relating to the telematics applications for freight subsystem of the trans-European conventional rail system (OJ L 13, 18.1.2006, p. 1).	18.1.2006
(6)	C(2010)2576 final	Commission Decision of 29 April 2010 concerning a mandate to the European Railway Agency to develop and review Technical Specifications for Interoperability with a view to extending their scope to the whole rail system in the European Union.	29.4.2010
(7)	Directive (EU) 2016/798	Directive (EU) 2016/798 of the European Parliament and of the Council of 11 May 2016 on railway safety (OJ L 138, 26.5.2016, p. 102).	26.5.2016
(8)	Commission Delegated Decision (EU) 2017/1474	Commission Delegated Decision (EU) 2017/1474 of 8 June 2017 supplementing Directive (EU) 2016/797 of the European Parliament and of the Council with regard to specific objectives for the drafting, adoption and review of technical specifications for interoperability (OJ L 210, 15.8.2017, p. 5).	15.8.2017

1.3. Technical scope

This Technical Specification for Interoperability (hereinafter referred to as the TAF TSI) concerns the element 'applications for freight services' of the subsystem 'telematics applications' included in the functional area of the list in Annex II to Directive (EU) 2016/797 and described in section 2.6(b) of that Annex.

The purpose of this TAF TSI is to ensure the efficient interchange of information by setting the technical framework, to achieve a transport process that is as economically viable as possible. It covers the applications for freight services and the management of connections with other modes of transport, which means that it concentrates on the transport services of an RU in addition to the pure operation of trains. Safety aspects are only considered as far as the existence of data elements; values will have no impact on the safe operation of a train and compliance with TAF TSI requirements cannot be regarded as compliance with safety requirements.

TAF TSI also has an impact on the conditions of use of rail transport by users. In this respect the term users means not only infrastructure managers or railway undertakings but also all other service providers such as wagon companies, intermodal operators and even customers.

1.4. Geographical Scope

The TSI shall apply to the Union's network as defined in Annex I, Section 1 of Directive (EU) 2016/797.

2. DEFINITION OF SUBSYSTEM AND SCOPE

2.1. Function within the scope of the TSI

The subsystem Telematics Applications for Freight is defined in Annex II of the Directive (EU) 2016/797, Section 2.6 (b).

It includes in particular:

– applications for freight services, including information systems (real-time monitoring of freight and trains),

– marshalling and allocation systems, whereby under allocation systems is understood train composition,

– reservation systems, whereby here is understood the train path reservation,

– management of connections with other modes of transport and production of electronic accompanying documents.

2.2. Functions outside the scope of the TSI

Payment and invoicing systems for customers are not within the scope of this TSI, nor are such systems for payment and invoicing between various service providers such as railway undertakings or infrastructure managers. The system design behind the data exchange in accordance with Chapter 4.2 (Functional and technical specifications of the subsystem), however, provides the information needed as a basis for payment resulting from the transport services.

The long term planning of the timetables is outside the scope of this Telematics Applications TSI. Nevertheless, at some points there will be reference to the outcome of the long term planning in so far as there is a relationship with the efficient interchange of information required for the operation of trains.

2.3. Overview of the subsystem description

2.3.1. Considered Processes

When taking into account the needs of a Customer, one of the services is to organise and manage the transport line in accordance with the contract between the Lead Railway Undertaking (LRU) and the Customer.

The LRU is the single point of contact for the Customer. If more than one Railway Undertaking is involved in the transport chain, the LRU is also responsible for the co-ordination with the other RUs. This service can also be undertaken by a forwarder or by any other entity.

This TSI for the railway freight transport industry is limited in accordance with Directive (EU) 2016/797 to IMs and RUs/LRUs data exchange. This TSI enables the LRU to provide information to the Customer in particular:

– Path information.

– Train Running Information on agreed reporting points, including at least departure, interchange/handover and arrival points of the contracted transport.

– Estimated Time of Arrival (ETA) to the final destination including yards and intermodal terminals.

– Service Disruption. When the Lead RU learns about a service disruption, it shall deliver to the Customer in due time.

For the delivery of this information, the respective TAF compliant messages are defined in Chapter 4.

The RUs/LRUs must in general have, at minimum, the capability of:

– DEFINING: services in terms of price and transit times, wagon supply (where applicable), wagon/Intermodal unit information (location, status and the wagon/Intermodal unit related estimated time of arrival 'ETA'), where shipments can be loaded on empty wagons, containers etc.,

– DELIVERING: the service that has been defined in a reliable, seamless manner through the use of common business processes and linked systems. There must be a capability for RUs, IMs and other service providers and stakeholders such as customs to exchange information electronically,

– MEASURING: the quality of the service delivered compared to what was defined. i.e. billing accuracy against price quoted, actual transit times against commitments, wagon supplied against order, ETAs against actual arrival times,

– OPERATING: in a productive manner in terms of utilisation: train, infrastructure and fleet capacity through the use of business processes, systems and data exchange required to support wagon/Intermodal unit and train scheduling.

The handling of empty wagons takes on particular relevance when considering interoperable wagons. In principle, there is no difference in the handling of loaded or empty wagons. The transport of empty wagons is also based on consignment orders, whereby the fleet manager for these empty wagons must be considered as a customer.

3. ESSENTIAL REQUIREMENTS

3.1. Compliance with the essential requirements

In accordance with the Directive (EU) 2016/797, the Union Rail System, subsystems and their interoperability constituents must meet the essential requirements set out in general terms in Annex III of that Directive.

In the scope of the present TSI, the fulfilment of relevant essential requirements listed in Chapter 3 will be ensured for the subsystem by the compliance with the specifications described in Chapter 4 (Characterisation of the subsystem).

3.2. Essential requirements aspects

The essential requirements concern:

– Safety,

– Reliability and Availability,

– Health,

– Environmental protection,

– Technical compatibility.

– Accessibility.

According to Directive (EU) 2016/797, the essential requirements may be generally applicable to the whole Rail System within the European Union or be specific to each subsystem and its constituents.

3.3. Aspects relating to general requirements

The relevance of the general requirements to the Telematics Applications Subsystem for Freight is determined as follows:

3.3.1. Safety

The essential requirements 1.1.1, 1.1.2, 1.1.3, 1.1.4 and 1.1.5 of Annex III to Directive (EU) 2016/797 are not relevant to the Telematics Applications subsystem.

3.3.2. Reliability and availability

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

This essential requirement is met by the following Chapters:

– Chapter 4.2.9: The Main Reference Data,

– Chapter 4.2.10: Various Reference Files and databases,

– Chapter 4.2.11: Networking & Communication.

3.3.3. Health

The essential requirements 1.3.1 and 1.3.2 of Annex III to Directive (EU) 2016/797 are not relevant to the Telematics Applications subsystem.

3.3.4. Environmental protection

The essential requirements 1.4.1, 1.4.2, 1.4.3, 1.4.4 and 1.4.5 of Annex III to Directive (EU) 2016/797 are not relevant to the Telematics Applications subsystem.

3.3.5. Technical compatibility

The essential requirement 1.5 of Annex III to Directive (EU) 2016/797 is not relevant to the Telematics Applications subsystem.

3.3.6. Accessibility

The essential requirement 1.6 of Annex III to Directive 2016/797 is not relevant to the Telematics Applications subsystem.

4. CHARACTERISATION OF THE SUBSYSTEM

4.1. Introduction

The rail system, to which Directive (EU) 2016/797 applies and of which the Telematics Applications Subsystem is a part, is an integrated system whose consistency must be verified. This consistency must be checked in particular with regard to the specifications of the subsystem, its interfaces vis-à-vis the system in which it is integrated, as well as the operating and maintenance rules.

Taking into account all the applicable essential requirements, the Telematics Application Subsystem for Freight is characterised by:

4.2. Functional and technical specifications of the subsystem

In light of the essential requirements in Chapter 3, the functional and technical specifications of the subsystem cover the following parameters:

– Object Identifiers

– Consignment Note data,

– Path Request and Path Allocation,

– Train Preparation,

– Train Running Information and Train Running Forecast,

– Service Disruption Information,

– Wagon/Intermodal unit ETI/ETA,

– Wagon Movement,

– Data Exchange for Quality Improvement,

– The Main Reference Data,

– Various Reference Files and Databases,

– Networking & Communication.

In addition to the provisions from the Chapter 4 and its sub-chapters every stakeholder may exchange the messages according to Chapters 4.2.3.3 (only during operation or preparation of train operation), 4.2.5.2, 4.2.5.3, 4.2.6.2, 4.2.7.3, 4.2.7.4, 4.2.8.3 to 4.2.8.8 with other stakeholders involved in the same freight service, under the condition that the stakeholders are identifiable. These exchanges of messages may be charged by the sender.

The LRU is responsible for the information to the Customers according to the contractual agreement.

The detailed data specifications are defined in the complete Data Catalogue. The mandatory formats of the messages and the data of this Catalogue are defined in the document 'TAF TSI — Annex D.2: Appendix F — TAF TSI Data and Message Model' listed in Appendix I. In addition, other existing standards may be used for the same purpose if there is a specific agreement between the parties involved to allow the use of these standards in particular for combined / intermodal transport or on the territories of EU Member States having a border with third countries.

General remarks on the message structure

The messages are structured into two data sets:

– Control data: defined through the mandatory message header of the messages of the catalogue.

– Information data: defined by the mandatory/optional content of each message and mandatory/optional data set in the catalogue.

If a message or a data element is defined as optional in this Regulation, the involved parties decide on using it. The application of these messages and data elements must be part of a contractual agreement. If in the data catalogue optional elements are mandatory under certain conditions this has to be specified in the data catalogue.

4.2.1. Object Identifiers

Objects exchanged between RUs and IMs shall be marked with unique identifiers created by the owner of the object in the planning phase. Identifiers exist for the following objects:

– The Train object shall describe the planned train and its entire journey for the purpose of its owner LeadRU/RA. It is transmitted to the IM via the Reference Train Identifier, the object Route and the object Path Request.

– The Route object owned by LeadRU/RA shall contain the minimum set of information about the entire journey of the planned train that an IM needs to perform its duties.

– The Path Request object owned by LeadRU/RA/RRU shall describe the details of the path requested for the planned train on the IM network.

– The Path object owned by the IM shall describe the details of the allocated path coordinated between the involved IMs. The Operational Train Number is an attribute thereof, which might change within the lifecycle of the path or of the linked train.

– The Case Reference object owned by LeadRU/RA/RRU or IM shall gather objects or shall refer to additional information according to a dedicated and bilaterally agreed use case.

Objects for their complete lifecycle shall be linked with messages using a unique and stable Reference Train Identifier.

The objects are described in the technical document ERA-TD-105 'TAF TSI - Annex D.2: Appendix F - TAF TSI Data and Message Model'.

4.2.2. Consignment Note data

4.2.2.1. Customer Consignment Note

The Customer shall send the Consignment Note to the Lead RU. It must show all the information needed to carry a consignment from the consignor to the consignee according to 'Uniform Rules Concerning the Contract of International Carriage of Goods by Rail (CIM)'[1] and 'Uniform Rules concerning Contracts of Use of Vehicles in International Rail Traffic (CUV)'. The LRU must supplement additional information. A subset of the consignment note data including the additional ones, are described in Appendix I, TAF TSI — ANNEX D.2: APPENDIX A (WAGON/ILU TRIP PLANNING) and Appendix I, TAF TSI — Annex D.2: Appendix F — TAF TSI Data and Message Model (4))) listed in the table in Appendix I of this Regulation.

In the case of Open Access the Lead RU contracting with the customer has all the information after the supplement of the data available. No message exchange is needed with other RUs. These data are also the basis for a path request on short notice, if this is required for the execution of the consignment note.

The following messages are for the case of non-Open Access. The content of these messages may also be the basis for the path requests on short notice, if required for the execution of the consignment note.

4.2.2.2. Consignment order message

The 'Consignment Order message' is primarily a subset of the Consignment Note information. The LRU shall send the 'Consignment Order message' to the RUs involved in the transport chain. It may be made available according to agreement between LRU/RU and Terminal Manager or Operator of Service Facility. The content of the Consignment Order message must show the relevant information which is needed for an RU to effect transportation during its responsibility until handover to next RU.

Upon request of competent authorities, regulatory information for the purpose of Regulation (EU) 2020/1056 shall be made available as a subset of the Consignment Order Message.

The mandatory data structure of the consignment order and detailed formats of this message are listed in the 'Consignment Order Message' in the document 'TAF TSI — Annex D.2: Appendix F — TAF TSI Data and Message Model' listed in Appendix I

The main contents of these consignment orders are:

– Consignor and consignee information,

– Routing information,

– Consignment identification,

– Wagon information,

– Place and time information.

4.2.3. Path Request and path allocation

This basic parameter is common with TAP TSI section 4.2.16.

[1] For the carriage of rail freight between Europe and 3rd countries (Asia) it must be used where appropriate in conjunction with the CIM/SMGS Consignment Note.

4.2.3.1. Preliminary remarks

The Path defines the requested, accepted and actual data to be stored concerning the path and the characteristics of the train for each segment of that path. The following description presents the information, which must be available to the infrastructure manager and/or the allocation body (AB). . This information must be updated whenever a change occurs. The information of the annual path therefore needs to allow the retrieval of the data for short-term amendments. In particular, the Customer, in case he is impacted, must be informed by LRU.

Path Request on short notice

Due to exceptions during the train running or due to transport demands on a short time basis, a railway undertaking or an Applicant must have the possibility to get an ad hoc path on the network.

The RU/Applicant acting in the role of the Responsible Applicant must provide the infrastructure manager with all necessary data concerning when and where the train is required to run together with the physical characteristics in so far as they interact with the infrastructure. These requirements are valid for all Short Notice Path Requests and related messages. No minimum timeframe is specified for it at European level. The network statement may specify minimum timeframes.

Path Request on short notice does not include Traffic Management issues. The time limit between Short Term paths and Traffic Management path changes is subject to Local Agreements and may be indicated in the network statement. .

Requirements considering the responsibilities of a RU/Applicant/IM during the path request and allocation processes are not part of this regulation. Relevant information is given within the Commission Implementing Regulation (EU) 2019/773[2] (OPE TSI).

4.2.3.2. Path Request message

The RU/Applicant assuming the role of Responsible Applicant shall send the 'Path Request message' to the IM/Allocation Body (AB) to request a path.

The definition of the mandatory structure of the 'Path Request message' and the elements to be followed are described in the document 'TAF TSI — Annex D.2: Appendix F — TAF TSI Data and Message Model' listed in Appendix I.

4.2.3.3. Path Details message

The IM/AB acting as Planning IM shall send the 'Path Details message' to the requesting RU/Applicant in response to its Path Request.

The definition of the mandatory structure of Path Details message and the elements to be followed are described in the document 'TAF TSI — Annex D.2: Appendix F — TAF TSI Data and Message Model' listed in Appendix I.

4.2.3.4. Path Confirmed message

The requesting RU/Applicant assuming the role of Responsible Applicant shall send the 'Path Confirmed message' to confirm the Path proposed by the IM/AB.

[2] Commission Implementing Regulation (EU) 2019/773 of 16 May 2019 on the technical specification for interoperability relating to the operation and traffic management subsystem of the rail system within the European Union and repealing Decision 2012/757/EU (OJ L 139I, 27.5.2019, p. 5).

The definition of the mandatory structure of Path Confirmed message and the elements to be followed are described in the document 'TAF TSI — Annex D.2: Appendix F — TAF TSI Data and Message Model' listed in Appendix I.

4.2.3.5. Path Details Refused message

The requesting RU/Applicant assuming the role of Responsible Applicant shall send the 'Path Details Refused message' to the relevant IM/AB to reject its proposed Path Details.

The definition of the mandatory structure of Path Details Refused message and the elements to be followed are described in the document 'TAF TSI — Annex D.2: Appendix F — TAF TSI Data and Message Model' listed in Appendix I.

4.2.3.6. Path Cancelled message

The RU/Applicant assuming the role of Responsible Applicant (in planning phase) or assuming the role of Responsible RU (in operation) shall send the 'Path Cancelled message' to the relevant IM/AB to cancel all or part of a Path that has been confirmed.

The definition of the mandatory structure of Path Cancelled message and the elements to be followed are described in the document 'TAF TSI — Annex D.2: Appendix F — TAF TSI Data and Message Model' listed in Appendix I.

4.2.3.7. Path Not Available message

The IM/AB assuming the role Planning IM (in planning phase) or in the role Responsible IM (in operation) shall send the 'Path Not Available message' to the contracted RU/Applicant in the event that the Path confirmed by the RU/Applicant is no longer available.

The IM must inform the RU as soon as it has the knowledge that a train path is not available. The 'Path Not Available message' can be send at any time between the moment the train path is contracted and the departure of the train. A cause of this message may be e.g. an interruption on the path.

'Path Not Available message' means that the path or a part of the path cannot be used and no longer exists.

If an alternative path is available, together with this message or as soon as that path is known, the IM must send without any further request from the RU an alternative proposal. This is done with the 'Path Details message' related to this 'Path Not Available message'. If an alternative proposal is not possible, the IM must inform the RU immediately.

The definition of the mandatory structure of Path Not Available message and the elements to be followed are described in the document 'TAF TSI — Annex D.2: Appendix F — TAF TSI Data and Message Model' listed in Appendix I.

4.2.3.8. Receipt Confirmation message

The recipient of each message shall send the 'Receipt Confirmation message' to the originator of the related message in order to acknowledge that its legacy system has received the message.

The definition of the mandatory structure of Receipt Confirmation message and the elements to be followed are described in the document 'TAF TSI — Annex D.2: Appendix F — TAF TSI Data and Message Model' listed in Appendix I.

4.2.4. Train Preparation

4.2.4.1. General Remarks

This basic parameter describes the messages, which must be exchanged during the train preparation phase until the start of the train.

Train preparation includes compatibility check between the train and the route. This check is done by the ResponsibleRU on basis of information provided by concerned IMs on infrastructure description and infrastructure restrictions.

4.2.4.2. Train Composition message

The Responsible RU shall send the 'Train Composition message' defining the composition of the train to the next Responsible RU involved in the freight service and to the Lead RU. According to network statement, the 'Train Composition message' is also to be sent from the Responsible RU to the IM(s). It may be made available according to agreement between LRU/RU and Terminal Manager or Operator of Service Facility.

In case the train is taken over as a whole by the next RU, the Responsible RU shall send the Train Composition to the next Responsible RU. According to contractual agreements this message must also be sent from the Responsible RU to the IM(s). This applies as well, if the path has been booked by another Responsible Applicant, who has mandated the Responsible RU with the train run. Furthermore, the Responsible RU remains the partner for the message exchange with the IM, if it subcontracts the run of the train to another RU.

If the train composition is changed at a location, this message must be exchanged once more with information updated by the Responsible RU.

The definition of the mandatory structure of Train Composition message and the elements to be followed are described in the document 'TAF TSI — Annex D.2: Appendix F — TAF TSI Data and Message Model' listed in Appendix I.

Minimum elements to be delivered for the message exchange between RU and IM for the purpose Train Composition are defined in Chapter 4.2.2.7.2 of Implementing Regulation (EU) 2019/773 (OPE TSI).

4.2.4.3. Train Ready message

The Responsible RU shall send a 'train ready' message to the IM every time a train is ready to start after train preparation, unless under national rules the IM accepts the timetable as a 'train ready' message.

In the case of combined transport, the Terminal Operator shall send a 'train ready' message to the RU every time a wagon set is ready to start. The RU providing traction to the IM entry point shall send the 'train ready' message to the RU operating the train service on the IM network.

The definition of the mandatory structure of Train Ready message and the elements to be followed are described in the document 'TAF TSI — Annex D.2: Appendix F — TAF TSI Data and Message Model' listed in Appendix I.

4.2.5. Train Running Information and Train Running Forecast

4.2.5.1. General Remarks

This basic parameter lays down the train running information and train running forecast. It must prescribe how the dialogue between infrastructure manager and

railway undertaking are to be maintained in order to exchange train running information and train running forecasts.

This basic parameter lays down how the infrastructure manager must, at the appropriate time, send train running information to the railway undertaking and the subsequent neighbouring infrastructure manager involved in the operation of the train.

The train running information serves to provide details of the current status of the train at contractually agreed reporting points.

The train running forecast is used to provide information about the estimated time at contractually agreed forecast points. This message shall be sent from the infrastructure manager to the railway undertaking and the neighbouring infrastructure manager involved in the run.

Contractual agreements shall specify Reporting Points for the train's movement.

This information exchange between RUs and IMs always takes place between the IM in charge and the Responsible RU. This applies as well, if the path has been booked by another Responsible Applicant, who has mandated the Responsible RU with the train run. Furthermore, the Responsible RU remains the partner for the message exchange with the IM, if it subcontracts the run of the train to another RU.

Under contractual agreement, the LRU will provide Customer the Train Running Forecast and Train Running Information. The reporting points will be agreed by both parties within the contract.

4.2.5.2. Train Running Forecast message

This message must be issued by the IM to the ResponsibleRU for handover points, interchange points and for the train destination as described in Chapter 4.2.5.1.

In the case of combined transport under contractual agreement, the LRU/Responsible RU shall ensure the ‘Train Running Forecast’ message is provided to the Terminal Operator.

In addition, the message must be issued by the IM to the RU for other reporting points according the RU/IM contracts.

A train running forecast can also be sent before the train starts running. For additional delays occurring between two Reporting Points, a threshold has to be contractually defined between the railway undertaking and the infrastructure manager to which an initial or a new forecast has to be sent. If the extend of delay is not known, the infrastructure manager has to send a ‘service disruption message’ (see Chapter 4.2.6: Service disruption information).

The train running forecast message must give the forecast time for agreed forecast point and it should be possible for the recipient of the information to assess its accuracy and reliability, according, to the methodology as set out in Appendix IV.

The Infrastructure Manager shall send this message to the next neighbouring infrastructure manager involved in the train run.

The definition of the mandatory structure of Train Running Forecast message and the elements to be followed are described in the document ‘TAF TSI — Annex D.2: Appendix F — TAF TSI Data and Message Model’ listed in Appendix I.

4.2.5.3. Train Running Information message and Train Delay Cause Message.

The ‘Train Running Information message’ must be issued by the IM to the Responsible RU upon:

– Departure from departure point, arrival at destination,

– Arrival and departure at handover points, interchange points and at agreed reporting points based on contract (e.g. handling points).

As soon as a cause of delay is known (first assumption), and in case of update on the cause of delay, it should be provided by the IM to the Responsible RU by the separate Train Delay Cause Message.

The definition of the mandatory structure of Train Running Information message and Train Delay Cause Message and the elements to be followed are described in the document ‘TAF TSI — Annex D.2: Appendix F — TAF TSI Data and Message Model’ listed in Appendix I.

4.2.6. Service Disruption Information

4.2.6.1. General Remarks

This basic parameter lays down how service disruption information is handled between the RU and the IM.

When the ResponsibleRU learns about a service disruption during the train running operation, it must immediately inform the IM concerned (this may be done orally by the ResponsibleRU). If train running is interrupted, the infrastructure manager shall send ‘a ‘Train Running interruption’’ message to the contracted RU and the next neighbouring IM involved in the train run.

If the length of the delay is known, the IM shall send a train running forecast message instead

4.2.6.2. Train Running Interruption message

If the train is interrupted, the IM issues this message to the next neighbouring IM involved in the train run and to the Responsible RU.

In the case of combined transport under contractual agreement, the LRU/RU shall ensure the ‘Train Running Interruption’ message is provided to the Terminal Operator.

The definition of the mandatory structure of Train Running Interruption message and the elements to be followed are described in the document ‘TAF TSI — Annex D.2: Appendix F — TAF TSI Data and Message Model’ listed in Appendix I.

4.2.7. Shipment ETI/ETA

4.2.7.1. Preliminary remarks

Chapter 4.2.2 (Path Request) has mainly described the communication between the RU and the IM. The individual monitoring of wagons or Intermodal units is not covered by this information exchange. This is done on the RU/LRU level based on the train related messages and is described in the following Chapters 4.2.6 (Shipment ETI/ETA) to 4.2.7 (Wagon Movement).

The wagon or Intermodal unit related information exchange and updating are essentially supported by storage of ‘trip plans’ and ‘wagon movements’ (Chapter 4.2.10.2: Other Databases).

For a customer the most important information is always the estimated time of arrival (ETA) for its shipment and for the train (TETA - Train Estimated Times of Arrivals). The wagon related ETA as well as the ETI is also the basic information in the communication between LRU and RU. This information is the main instrument for the LRU to monitor the physical transport of a shipment and to check it against the commitment to the customer.

The forecasted times in the train related messages are all related to an arrival of a train at a certain point, which may be a handover point, interchange point, the train destination or another reporting point. These are all Train Estimated Times of Arrivals (TETA).

Under contractual agreement, the LRU will provide Customer the estimated time of arrival (ETA) and estimated time of interchange (ETI) at shipment level and TETA at train level. The level of detail will be agreed by both parties within the contract.

For combined transport, the data messages containing the identifiers of the loading units (e.g. containers, swap-bodies, semi-trailers) will use either a BIC- or an ILU-Code according to ISO 6346 and EN 13044 respectively.

4.2.7.2. ETI/ETA calculation

The ETI/ETA calculation is based on the information from the infrastructure manager in charge, which sends, within the Train Running Forecast message, the Train Estimated Time of Arrival for defined reporting points (in any case for handover, interchange, or arrival points including Intermodal terminals) on the agreed train path e.g. for the handover point from one IM to the next IM (in this case TETA is equal to ETH).

For the interchange points or for other defined reporting points on the agreed train path, the RU must calculate for the next RU in the transport shipment chain, the estimated time of interchange (ETI) for the wagons and/or Intermodal units.

Remark on combined transport: For the Intermodal units on a wagon, the wagon ETIs are also ETIs for the Intermodal units. Regarding the ETAs for Intermodal units it should be noticed, that the RU is not in the position to calculate such an ETA or TETA beyond the public IM network. Therefore, the RU can only deliver ETIs related to the RU operating in the terminal that will provide an ETA or TETA to the Arrival Terminal Operator. Based on this ETA and TETA, the Terminal Operator will provide an ETP to the Combined Transport Operator, who will provide the final customer (such as freight forwarders, logistics service providers…) with the same ETP.

The Lead RU is responsible for the comparison of the ETA and TETA with the commitment to the customer.

Deviations of the ETA and TETA against the commitment to the customer must be handled in accordance with the contract and may lead to an alert management process by the LRU. For the transmission of information on the result of this process is foreseen the Alert message.

For any ETA, ETI, or TETA which is computed and shared with stakeholders, it should be possible for the recipient of the information to assess the accuracy and the reliability of the provided estimates, according to the methodology as set out in Appendix IV.

As a basis for the Alert management process, the LRU must have the possibility for a train or a wagon related enquiry on deviations. This enquiry of an LRU and the response from an RU is also specified below.

4.2.7.3. Wagon ETI/ETA message

The purpose of this message is to send ETI or updated ETI from one Responsible RU to the next in the transport chain.

All Responsible RUs in the transport chain of the wagons send the ETI/ETA or updated ETI/ETA to the LRU. Under contractual agreement based on the collected ETIs, the Lead RU shall calculate and provide an accurate ETA or TETA to its Customer and to the Terminal Operator

The definition of the mandatory structure of Wagon ETI/ETA message and the elements to be followed are described in the document 'TAF TSI — Annex D.2: Appendix F — TAF TSI Data and Message Model' listed in Appendix I.

4.2.7.4. Alert message

Following the comparison between ETA and commitment to the customer, the LRU may send an Alert message to the RUs involved. The definition of the mandatory structure of Alert message and the elements to be followed are described in the document 'TAF TSI — Annex D.2: Appendix F — TAF TSI Data and Message Model' listed in Appendix I.

Remark: In case of Open Access the calculation of ETI and ETA is an RU internal process. In this case the RU is the lead RU itself.

4.2.8. Wagon Movement

4.2.8.1. Preliminary Remarks

For the reporting of the movement of a wagon, data included in these messages must be stored and electronically accessible. They must be also exchanged within message on contractual base to authorised parties.

– Wagon Release notice

– Wagon Departure notice

– Wagon Yard arrival

– Wagon Yard departure

– Wagon Exceptions message

– Wagon Arrival notice

– Wagon Delivery notice

Under contractual agreement, the LRU must provide to the Customer the wagon movement information using the messages described below.

4.2.8.2. Wagon Release Notice message

The Lead RU is not necessarily the first RU in the transport chain. In this case the LRU must tell the RU in charge that the wagon is ready for pull at the customer sidings (Place of departure according to the LRU commitment) at the given release time (date and time of departure).

These events may be stored in the Wagon and Intermodal Unit Operational Database. The definition of the mandatory structure of Wagon Release Notice message and the elements to be followed are described in the document 'TAF TSI — Annex D.2: Appendix F — TAF TSI Data and Message Model' listed in Appendix I.

4.2.8.3. Wagon Departure Notice message

The RU must inform the LRU of the actual Date and Time that the wagon has been pulled from the place of departure.

These events may be stored in the Wagon and Intermodal Unit Operational Database. With this message exchange the responsibility for the wagon changes from customer to the RU. The definition of the mandatory structure of Wagon Departure Notice message and the elements to be followed are described in the document 'TAF TSI — Annex D.2: Appendix F — TAF TSI Data and Message Model' listed in Appendix I.

4.2.8.4. Wagon Yard Arrival message

The RU must inform the LRU, that the wagon has arrived at its yard. This message can be based on a 'Train running information' message from Chapter 4.2.4 (Train Running Forecast). This event may be stored in the Wagon and Intermodal Unit Operational Database. The definition of the mandatory structure of Wagon Yard Arrival message and the elements to be followed are described in the document 'TAF TSI — Annex D.2: Appendix F — TAF TSI Data and Message Model' listed in Appendix I.

4.2.8.5. Wagon Yard Departure message

The RU must inform the LRU, that the wagon has left its yard. This message can be based on a 'Train running information' message from Chapter 4.2.4 (Train Running Forecast). This event may be stored in the Wagon and Intermodal Unit Operational Database. The definition of the mandatory structure of Wagon Yard Departure message and the elements to be followed are described in the document 'TAF TSI — Annex D.2: Appendix F — TAF TSI Data and Message Model' listed in Appendix I.

4.2.8.6. Wagon Exception message

The RU must inform the LRU if something unexpected occurs to the wagon, which might have an impact for the ETI/ETA, or requires any additional action. This message requires in most of the cases also a new ETI/ETA calculation. If the LRU decides to have a new ETI/ETA, it sends a message back to the RU, which has sent this message together with the indication 'ETI/ETA requested' (message: Wagon Exception message New ETI/ETA Request). The new ETI/ETA calculation must follow the procedure of Chapter 4.2.6 (Shipment ETI/ETA).

This information may be stored in the Wagon and Intermodal Unit Operational Database. The definition of the mandatory structure of Wagon Exception message and the elements to be followed are described in the document 'TAF TSI — Annex D.2: Appendix F — TAF TSI Data and Message Model' listed in Appendix I.

4.2.8.7. Wagon Arrival Notice message

The last RU in a wagon or Intermodal unit transport chain must inform the LRU that the wagon has arrived at its yard (RU location). The definition of the mandatory structure of Wagon Arrival Notice message and the elements to be followed are described in the document 'TAF TSI — Annex D.2: Appendix F — TAF TSI Data and Message Model' listed in Appendix I.

4.2.8.8. Wagon Delivery notice message

The last RU in a wagon transport chain must inform the LRU that the wagon has been placed at the consignee's sidings.

Remark: In the case of Open Access the described wagon movement is a RU (LRU) internal process. Nevertheless all calculations and data storage must be executed by it as the LRU having a contract with and a commitment to the customer.

The sequence diagram for these messages based on example 1 for the ETI calculation for the wagons 1 and 2 (see Chapter 4.2.6.2: ETI/ETA calculation) is integrated in the diagram for interchange reporting in the document 'TAF TSI — Annex A.5:Figures and Sequence Diagrams of the TAF TSI messages' Chapter 6, listed in Appendix I.

4.2.9. Data Exchange for Quality Improvement

To be competitive the European Railway Industry must deliver higher service quality to its customers (see also Annex III, Article 2.7.1 to the Directive (EU) 2016/797). A measurement process is an essential post trip process to support quality improvements. In addition to measuring the service quality delivered to the customer, LRUs, RUs and IMs must measure the quality of the service components that in total make up the product delivered to the customer. The process involves the IMs and the RUs (especially if they are Lead RUs) selecting an individual quality parameter, a route or location and a measurement period in which actual results are to be measured against predetermined criteria and which normally have been set out in a contract. The results of the measurement process must clearly show the achievement level against the target, which has been agreed upon between the contracting parties.

4.2.10. The Main Reference Data

4.2.10.1. Preface

In order to support the train preparation and wagon operation the wagon keeper shall make available rolling stock data in the Rolling Stock Reference Database.

In order to support Combined Transport, the keeper of Intermodal Loading Unit (ILU) including all types of semi-trailers shall make available Intermodal Loading Unit data in the ILU European Reference Database.

4.2.10.2. The Rolling Stock Reference Databases

The keeper of rolling stock is responsible for the storage of rolling stock data within a Rolling Stock Reference Database.

The Information that must be included in the individual Rolling Stock Reference Databases is described in detail in Appendix I, Appendix C.

The Rolling Stock Reference Databases must allow easy access to the rolling stock reference data to minimise the volume of data transmitted for each operation. Contents of the Databases must be accessible, based on structured access rights depending on privilege to all Service Providers (especially IMs and RUs).

The entries in the Rolling Stock Reference Database can be grouped as follows:

– Administrative data, related to certification and registration items. Additionally, according to Commission Regulation (EU) No 445/2011[3], article 5, the Wagon Keepers shall store the ECM certification identification number

[3] Commission Regulation (EU) No 445/2011 of 10 May 2011 on a system of certification of entities in charge of maintenance for freight wagons and amending Regulation (EC) No 653/2007 (OJ L 122, 11.5.2011, p. 22).

– Design data, which shall include all constitutive (physical) elements of the rolling stock, especially information required by RUs for train planning and operation.

The keeper is obliged to ensure that these data are available and the processes behind have been conducted.

The definition of the mandatory structure of Rolling Stock Reference Database and the elements to be followed are described in the document 'TAF TSI — Annex D.2: Appendix F — TAF TSI Data and Message Model' listed in Appendix I.

4.2.10.3. The Intermodal Loading Unit Single Reference Database

The keeper of Intermodal Loading Unit (ILU) is responsible for the sharing of ILU-related data within a single centralised ILU Reference Database.

This Database is managed and maintained centrally for the the ILU-Codes as specified in EN13044-1. Maritime containers do not have to be registered in the ILU single centralised Reference Database.

The Information that must be included in the single centralised ILU Reference Database is described in detail in the document 'TAF TSI - Annex D.2: Appendix C - Reference Files' listed in Appendix I. They must contain all items for:

– identification of an ILU (based on the ILU-Code structure as specified in EN13044-1);

– assessment of type of ILU and its compatibility;

– assessment of relevant loading characteristics.

The single centralised ILU Database must allow easy access to the ILU-related data to minimise the volume of data transmitted for each operation and to increase the efficiency of intermodal operations (wagon loading, train optimization, route compatibility). Contents of the Databases must be accessible, based on structured access rights depending on privilege to all Service Providers (especially Operators of Service Facility, Combined Transport Operators, Railway Undertakings).

The entries in the single centralised ILU Database can be grouped as follows:

– Administrative data related to certification and registration items.

– Design data, which shall include the basic physical technical characteristics of ILUs, especially information required by Operators of service facility and RUs for train preparation and operation.

The keeper of ILUs is obliged to ensure that these data are available and the processes behind have been conducted.

The definition of the mandatory structure of a Rolling Stock Reference Database and the elements to be followed are described in the document 'TAF TSI - Annex D.2: Appendix F - TAF TSI Data and Message Model' listed in Appendix I.

4.2.11. Various Reference Files and Databases

4.2.11.1. Reference Files

For the operation of freight trains on the European network, the following reference files must be available and accessible to all service providers (IMs, RUs, logistic providers and fleet managers). The data must represent the actual status at all times. Where a reference file is in common use with the TAP TSI, the development and changes must be in line with TAP TSI, in order to achieve optimum synergies.

The European Union Agency for Railways will centrally store and maintain unique codes for the following reference data:

– Reference File of the Coding for all IMs, RUs, Service provider companies;

– Reference File of the Coding of Locations (Primary and subsidiary),

The Agency will save a copy of the Reference File for the Primary Locations Codes and Company Codes. On individual request and without prejudice to intellectual property rights, this data shall be available for public consultation.

Other code lists are defined in the document 'TAF TSI — Annex D.2: Appendix F — TAF TSI Data and Message Model' listed in Appendix I.

4.2.11.2. Wagon and Intermodal unit Operational Database (optional)

To allow for the tracking of train and wagon movements, the Wagon and Intermodal Unit Operational Database, updated at each relevant event in real time, may be installed. Authorised entities such as keepers and fleet managers may have access to the data relevant to fulfil their functions, according to bilateral agreements.

The communication between the Lead RU and RUs in the cooperation mode is based on wagon and/or Intermodal unit numbers. Therefore, an RU, which communicates with the IMs at train level, must break down this information into wagon and Intermodal unit related one. This wagon and Intermodal unit related information may be stored in the Wagon and Intermodal Unit Operational Database. The information on train movement leads to new entries/updates in the Wagon and Intermodal Unit Operational Database for customer information. The movement part for a wagon or Intermodal unit in the database is set up at the latest when receiving the release time for the wagons or Intermodal unit from the customer. This release time is the first movement entry for a wagon into the Wagon and Intermodal Unit Operational Database related to an actual transport journey. The messages for the wagon movement are defined in the Chapter 4.2.7 (Wagon Movement). This database is accessible via the Common Interface (4.2.11.1: General Architecture and 4.2.11.6: Common Interface).

The Wagon and Intermodal Unit Operational Database is for the tracking of wagons and therefore for the communication between the RUs involved and the Lead RU. This database shows the movement of a wagon and of an Intermodal unit from departure through to final delivery at customer sidings with ETIs and actual times at different locations until the final delivery time ETA. The database also shows the different status of the rolling stock such as:

– Status: loading of the rolling stock

  This status is required for the information exchange between the RU and the IMs and to other railway undertakings involved in the transport journey

– Status: loaded wagon on journey

  This status is required for the information exchange between the IM and the RU, with other infrastructure managers and with other railway undertakings involved in the transport journey.

– Status: empty wagon on journey

  This status is required for the information exchange between the IM and the RU, with other infrastructure managers and railway undertakings involved in the transport journey.

– Status: unloading of rolling stock

  This status is required for the information exchange between the RU at destination and the Lead RU for the transport.

– Status: empty wagon under fleet management control

  This status is required to get the information about availability of a vehicle of defined characteristics.

4.2.11.3. Additional Requirements on the Databases

Every system (Database) must be able to support a clearly defined system accessibility and data accessibility / availability rules by enforcing the data consistency.

4.2.12. Networking & Communication

4.2.12.1. General Architecture

This basic parameter is common with TAP TSI section 4.2.23.1.

The aim of the IT architecture is to exchange information in secure trusted environment among all rail actors in the Single European Railway Area (SERA).

Over time this subsystem will see, the growth and interaction of a large and complex Telematics rail interoperability community with hundreds of participating players (RUs, IMs, etc.), which will compete and/or cooperate in serving the market's needs.

The Network & Communication infrastructure supporting such rail interoperability community will be based on a common Information Exchange Architecture, known and adopted by all those participating in it.

The proposed Information Exchange Architecture:

– is designed to reconcile heterogeneous information models by semantically transforming the data that are exchanged between the systems and by reconciling the differences in business process and application-level protocol,

– has a minimum impact on the existing IT architectures implemented by each actor,

– safeguards IT investments made already.

The Information Exchange Architecture is based on continuous IT industry mainstream standards, which ensure the relevant level of cybersecurity according to the identified risks. The interaction between all players must guarantee the overall integrity and consistency of the rail interoperability by providing a set of centralised services.

Architectural concept implementation, e.g. peer-to-peer communication, is based on technical standards for the Common Interface described in the technical document ERA-TD-104 'Annex D.2: Appendix E — Common Interface' listed in Appendix I.

A pictorial representation on the general architecture is given in the document 'TAF TSI — Annex A.5 Figures and Sequence Diagrams of the TAF TSI messages', Chapter 1.5, listed in Appendix I.

4.2.12.2. Network and Security

This basic parameter is common with TAP TSI section 4.2.11.2.

Network in this case means the method and philosophy of communication and does not mean the physical network.

The network shall ensure the necessary level for cybersecurity.

Rail interoperability is based on a common Information Exchange Architecture, known and adopted by all participants, thus encouraging and lowering barriers for new entrants, especially customers.

The security concept may be implemented on different layers of communication stack between two peers.

To achieve a high level of security, all messages must be self-contained, which means that the information in the message is secured and the receiver can verify the authenticity of the message. This may be solved by using an encryption and signing scheme similar to email encryption.

4.2.12.3. Encryption

This basic parameter is common with TAP TSI section 4.2.23.4.

Either asymmetric or symmetric encryption can be used for data transmission and storage, depending on the business requirements. For this purpose, a Public Key Infrastructure (PKI) is to be implemented.

The encryption is based on technical standards for the Common Interface described in the technical document ERA-TD-104 'Annex D.2: Appendix E — Common Interface' listed in Appendix I.

4.2.12.4. Central Repository

The Central Repository must be able to handle:

– metadata — structured data describing the content of messages,

– Public Key Infrastructure (PKI),

– Certification Authority (CA),

The management of the central repository should be under the responsibility of a non-commercial co-European organisation. Where the Central Repository is in use in conjunction with the TAP TSI, development and changes shall be performed as closely as possible to the implemented TAP TSI in order to achieve optimum synergies.

4.2.12.5. Common Interface

This basic parameter is common with TAP TSI section 4.2.23.6.

Compliance to the TSI, with respect to data exchange, means the exchange of mandatory TAF data catalogue elements (XSD) according to the provisions of TAF TSI Chapter 4.2.

This can use the Common Interface specifications including the use of XSD without any specific agreement between the involved parties. The Common Interface specifications should be regularly adapted to take new communication technologies into account.

And combination of any communication technologies is possible if there is a specific agreement between the involved parties as long it is aligned with the Common Interface specifications.

A Common Interface has to be able to ensure received and transmitted data format validity, authenticity and integrity for which the information in the central repository will be used.

4.2.12.6. Protocols

This basic parameter is common with TAP TSI section 4.2.23.3.

Only protocols belonging to the Internet Protocol Suite (commonly known as TCP/IP, UDP/IP etc.) may be used for developments.

4.3. Functional and technical specifications of the interfaces

In light of the essential requirements in Chapter 3, the functional and technical specifications of the interfaces are as follows:

4.3.1. Interfaces with the TSI Infrastructure

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

The subsystem Telematics Applications for Freight uses the data required for operational purposes as given by the path contract, possibly completed by infrastructure restriction data, as provided by the IM. Thus, no direct interface exists between this TSI and the TSI for infrastructure.

4.3.2. Interfaces with the TSI Control/Command and Signalling

The only connection to control command and signalling is via the

– Path contract, where within the line segment description the relevant information about usable command control and signalling equipment is given, and

– various Rolling Sock Reference Databases, where the command control and signalling equipment of the rolling stock must be stored.

4.3.3. Interfaces with the rolling stock subsystem

The subsystem Telematics Applications for freight identifies the technical and operational data, which must be available for the rolling stock.

The rolling stock TSI specifies the characteristics of a wagon. If the characteristics changes for a wagon, this must be updated in the Rolling Stock Reference Databases within the normal maintenance process for the database. Thus, no direct interface exists between this TSI and the TSI for rolling stock.

4.3.4. Interfaces with the TSI operation and traffic management

The subsystem Operation and Traffic Management specifies the procedures and related equipment enabling a coherent operation of the different structural subsystems, both during normal and degraded operation, including in particular train driving, traffic planning and management.

The subsystem Telematics Applications for Freight mainly specifies applications for freight services including real-time monitoring of freight and trains and the management of connections with other modes of transport. In order to ensure consistency between both TSIs, the following procedure applies.

When the specifications of the TSI Operation and Traffic Management related to the requirements of this TSI will be written and/or will become subject to amendments, then the body in charge of this TSI must be consulted.

In the case that the specifications of this TSI related to operational requirements specified in the TSI Operation and Traffic Management should be subject to any amendment, the body in charge of the TSI Operation and Traffic Management must be consulted.

4.3.5. Interfaces with the Telematics Applications for Passenger Services

Interface	Reference Telematics Applications for Freight TSI	Reference Telematics Applications for passengers TSI
Train ready	4.2.4.3 Train ready message	4.2.14.1 Train ready message for all trains
Train running forecast	4.2.5.2 Train running forecast message	4.2.15.2 'Train running forecast' message for all trains
Train running information	4.2.5.3 Train running information	4.2.15.1 'Train running information' message for all trains
Train running interrupted to RU	4.2.6.2 Train running interrupted	4.2.16.2 'Train running interrupted' message for all trains
Handling of short term timetable data	4.2.3 Path Request	4.2.17 Handling of short term timetable data for trains
Common Interface	4.2.12.6 Common Interface	4.2.21.7 Common interface for RU/IM communication

Central Repository	4.2.12.5 Central Repository	4.2.21.6 Central repository
Reference Files	4.2.11.1 Reference files	4.2.19.1 Reference files

4.4. Operating rules

In light of the essential requirements in Chapter 3, the operating rules specific to the subsystem concerned by this TSI are as follows:

4.4.1. Data quality

This basic parameter is common with TAP TSI section 4.4.1.

For data quality assurance purposes, the originator of any TSI message will be responsible for the correctness of the data content of the message at the time when the message is sent. Where the source data for data quality assurance purposes is available from the databases provided as part of the TSI, the data contained within those databases must be used for data quality assurance.

Where the source data for data quality assurance purposes is not provided from the databases provided as part of this TSI, the originator of the message must make the data quality assurance check from their own resources.

Data quality assurance will include comparison with data from databases provided as part of this TSI as described above plus, where applicable, logic checks to assure the timeliness and continuity of data and messages.

Data are of high quality if they are fit for their intended uses, which means they

– are Error free: accessible, accurate, timely, complete, consistent with other sources, etc., and

– possess desired features: relevant, comprehensive, proper level of detail, easy-to-read, easy-to-interpret, etc.

The data quality is mainly characterised by:

– Accuracy,

– Completeness,

– Consistency,

– Timeliness.

Accuracy:

The information (data) required needs to be captured as economically as possible. This is only feasible if the primary data is only recorded, if possible, on one single occasion for the whole transport. Therefore, the primary data should be introduced into the system as close as possible to its source, so that it can be fully integrated into any later processing operation.

Completeness:

Before sending out messages, the completeness and syntax must be checked using the metadata. This also avoids unnecessary information traffic on the network.

All incoming messages must also be checked for completeness using the metadata.

Consistency:

Business rules must be implemented in order to guarantee consistency. Double entry should be avoided and the owner of the data should be clearly identified.

The type of implementation of these business rules depends on the complexity of the rule. For simple rules, database constraints and triggers are sufficient. In case of more complex rules, which require data from various tables, validation procedures must be implemented which check the consistency of the data version before interface data are generated and the new data version becomes operational. It must be guaranteed that transferred data are validated against the defined business rules.

Timeliness:

The provision of information right in time is an important point. As far as the triggering for data storage or for message sending is event driven directly from the IT system the timeliness is not a problem if the system is designed in well manner according the needs of the business processes. But in most of the cases, the initiation of sending a message is done by an operator or at least is based on additional input from an operator. To fulfil the timeliness requirements the updating of the data must be done as soon as possible also to guarantee, that the messages will have the actual data content when sending out automatically by the system.

The response time for enquiries must be addressed for the various applications and user types within the detailed IT specifications. All data updates and exchanges shall be carried out as soon as possible.

Data quality Metrics:

The detailed IT specifications shall define appropriate percentages for:

– the completeness of data (percent of data fields having values entered into them) and the consistency of data (percent of matching values across tables/files/records),

– the timeliness of data (percent of data available within a specified threshold time frame),

– the required accuracy (percent of stored values that are correct when compared to the actual value).

4.4.2. Operating the central repository

The functions of the central repository are defined in Chapter 4.2.11.5 (Central Repository). For the purpose of data quality assurance, the entity operating the central repository shall be responsible for the updating and the quality of the metadata and also for the administration of the access control. Regarding the quality of the metadata in terms of completeness, consistency, timeliness and accuracy shall enable appropriate functioning for the purposes of this TSI.

4.5. Maintenance rules

This basic parameter is common with TAP TSI section 4.5.

In light of the essential requirements in Chapter 3, the maintenance rules specific to the subsystem concerned by this TSI are as follows:

The quality of the transport service must be guaranteed even if the data processing equipment were to break down in full or in part. It is therefore, advisable to install duplex systems or computers with a particularly high degree of reliability, and for which the uninterrupted operation during maintenance is ensured.

The maintenance aspects regarding the various databases are mentioned in Chapter 4.2.10.3 (Additional Requirements on the Databases).

4.6. Professional qualifications

This basic parameter is common with TAP TSI section 4.6.

The professional qualifications of staff required for the operation and maintenance of the subsystem and for implementing the TSI are as follows:

The implementation of this TSI does not require a complete new system in hardware and software with new staff. The realisation of the requirements of the TSI leads only to changes, upgrades or functional enlargements of the operation as it is already done by the existing staff. Therefore, there are no additional requirements to the existing national and European rules on professional qualifications.

If necessary, an add-on training of staff should not just consist of showing them how to operate equipment. The member of staff must know and understand his specific role to be played in the overall transportation process. Staff must in particular be aware of the requirement to maintain a high working performance level, since this is a decisive factor for the reliability of the information to be processed at a subsequent stage.

The professional qualifications needed for the composition and operation of trains are defined in the TSI Operation and Traffic Management.

4.7. Health and safety conditions

This basic parameter is common with TAP TSI section 4.7.

The health and safety conditions of staff required for the operation and maintenance of the subsystem concerned (or the technical scope as defined in paragraph 1.1) and for the implementation of the TSI are as follows:

There are no additional requirements to existing national and European rules on health and safety.

5. INTEROPERABILITY CONSTITUENTS

5.1. Definition

This basic parameter is common with TAP TSI section 5.1.

According to Article 2(7) of Directive (EU) 2016/797:

Interoperability constituents are ‘any elementary component, group of components, subassembly or complete assembly of equipment incorporated or intended to be incorporated into a subsystem, upon which the interoperability of the rail system depends directly or indirectly. The concept of a “constituent” covers both tangible objects and intangible objects such as software’.

5.2. List of Constituents

This basic parameter is common with TAP TSI section 5.2.

The interoperability constituents are covered by the relevant provisions of Directive (EU) 2016/797.

There are no interoperability constituents determined as far as the subsystem Telematics Applications is concerned.

For the fulfilment of the requirements of this TSI only standard IT equipment is needed, without any specific aspects for interoperability in the railway environment. This is valid for hardware components and for the standard software used like operating system and databases. The application software is individual on each user's side and can be adapted and improved according the individual actual functionality and needs. The proposed 'application integration architecture' assumes that applications might not have the same internal information model. Application integration is defined as the process of making independently designed application systems work together.

5.3. Constituents' Performances and Specifications

This basic parameter is common with TAP TSI section 5.3.

See Chapter 5.2, not relevant for the 'Telematics Applications.

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

6.1. Interoperability Constituents

6.1.1. Assessment Procedures

Not relevant for the Telematics Applications.

6.1.2. Module

Not relevant for the Telematics Applications.

6.2. Subsystem Telematics Applications for Freight

According to Annex II of the Directive (EU) 2016/797, the subsystems are broken down into structural and functional areas.

The conformity assessment is obligatory for TSIs in the structural area. The Subsystem Telematics Application for Freight belongs to the functional area and this TSI does not determine any modules for conformity assessment.

6.2.1. Assessment of compliance of IT tools

Projects in charge of IT tools deployed by the European rail sector may request the Agency to assess the compliance of those against the TSI requirements.

Request for assessment shall be accompanied by:

– Use Case document including:

– TAF TSI function covered

– Reference to TAF TSI chapter

– List and documentation of messages (including their sequence) to be tested

– Description of IT System, which uses TAF messages

– Description of communication interface of IT System (CI, other etc.)

– Information if request is for milestone of an EU funded project

– Version of the TAF TSI technical documents relevant to the scope of the assessment of the compliance

– XML file(s) of the IT System and their corresponding XSD file(s)

The Agency performs TAF TSI compliance test and issues an Agency compliance assessment report to the applicant within 3 months after confirming completeness. Compliance report covers following aspects:

– If the Message(s) carries all mandatory elements from TAF TSI,

– If the Message(s) complies with the TAF TSI technical documents,

– If the Messages sequence is compliant with TAF TSI.

Other than XML messages can also be delivered for test to determine whether they carry mandatory elements from the TAF TSI. In such case instead of XSD file(s) of the IT System it shall be delivered a message structure description with description of the data elements/fields, mentioning when applicable the applied standard(s) and their version.

7. IMPLEMENTATION

7.1. Introduction

This TSI concerns the subsystem telematics applications for freight/passenger. This subsystem is functional according to Annex II to Directive (EU) 2016/797. The application of this TSI therefore does not rely on the notion of new, renewed or upgraded subsystem, as is customary in the case of TSIs related to structural subsystems, except where it is specified in the TSI.

(a) Project governance

The development and deployment is put under the governance of the Telematics (TAF & TAP) Advisory Committee.

The Telematics (TAF & TAP) Advisory Committee is organised as follow:

– Telematics RU/IM Advisory Committee;

– Common Telematics Retail and RU/IM Advisory Committee;

– TSGA Advisory Committee:

  o regulatory services

  o other TAP TSI activities.

The Telematics Advisory Committee shall contribute to the work of the European Institutions to efficiently manage and coordinate the implementation of the TAF and

TAP-TSIs at the European level. This shall involve setting the policy, the strategic direction and prioritisation.

The Telematics Advisory Committee, co-chaired by the European Commission and a person nominated by the rail sector representative bodies, shall be composed of:

- the representative bodies from the railway sector acting on a European level as defined in Article 5(3) of Regulation (EU) 2016/796 ('the rail sector representative bodies');
- the Agency;
- the European Commission,
- the TAP TSI Services Governance Association (TSGA) and,
- other organisations proposed to the Telematics Advisory Committee to be included as observers where there are sound technical and organisational reasons for doing.

For TSGA services, the project governance structure is described in ERA TAP technical document B.61 in order to guarantee the appropriate development of the system.

(b) Development of the system

All railway stakeholders concerned shall deploy the system following their individual master plan.

(c) Deployment and operation monitoring process

The monitoring of the deployment and operation harmonized throughout Europe is managed by the ERA TAF and TAP Implementation Cooperation Group (ICG).

The ICG, established and managed by the Agency, is composed of:

- the Agency;
- the National Contact Points (see Appendix III);
- the Representatives Bodies and
- the TAP TSI Services Governance Association (TSGA);
- other organisations designated by the Agency and having relevant technical and organisational experience to be included as observers.

The ICG is made responsible for:

- assessing the progress of implementation and operation, analysing the deviations from the Master Plan and proposing improvement actions;

– assisting the NCPs to follow-up the TAF and TAP TSI implementation and operation at national level;

– approving the reports about the TAF and TAP TSI implementation and operation; further used by the Agency who reports to the European Commission, and to the Telematics Advisory Committee .

– Discuss and agree with NCPs any need for additional supporting actions from ERA, Member States or NCPs from the annual TAF TSI or TAP TSI implementation reportings.

7.2. Change Management

7.2.1. Change Management Process

Change management procedures shall be designed to ensure that the costs and benefits of change are properly analysed and that changes are implemented in a controlled way. These procedures shall be defined, put in place, supported and managed by the Agency and shall include:

– the identification of the technical constraints underpinning the change,

– a statement of who takes responsibility for the change implementation procedures,

– the procedure for validating the changes to be implemented,

– the policy for change management, release, migration and roll-out,

– the definition of the responsibilities for the management of the detailed specifications and for both its quality assurance and configuration management.

The Change Control Board (CCB) shall be composed of the Agency, rail sector representative bodies and Member States. Such an affiliation of the parties shall ensure a perspective on the changes that are to be made and an overall assessment of their implications. The CCB ultimately shall be brought under the aegis of the Agency.

7.2.2. Specific Change Management Process for documents listed in Appendix I to this Regulation

The change control management for the documents listed in Appendix I to this Regulation shall be established by the Agency in accordance with the following criteria:

(1) The change requests affecting the documents are submitted either via the Member States or via the representative bodies from the railway sector acting on a European level as defined in Article 38(4) of Regulation (EU) 2016/796, or via the TAF TSI Steering Committee.

(2) The Agency shall gather and store the change requests.

(3) The Agency shall present the change requests to the dedicated ERA working party, which will evaluate them and prepare a proposal accompanied by an economic evaluation, where appropriate.

(4) Afterwards the Agency shall present each change request and the associated proposal to the change control board that will or will not validate or postpone the change request.

(5) If the change request is not validated, the Agency shall send back to the requester either the reason for the rejection or a request for additional information about the draft change request.

(6) If the change request is validated, the technical document shall be amended.

(7) If no consensus about the validation of a change request can be reached, the Agency shall submit to the Commission a recommendation to update the documents listed in Appendix I together with the draft new version of the document, the change requests and their economic evaluation and shall make these documents available on their web site.

(8) The new version of the technical document with the validated change requests shall be made available at the site of the Agency. The Agency will keep the Member States informed via the Committee established in accordance with Article 51(1) of Directive (EU) 2016/797.

(9) If a change request would require a change of the legal text of the TAF TSI, the Agency shall send a request to the European commission to request a revision of the TAF TSI and/or request the technical opinion from the Agency.

(10) Where change control management affects elements which are in common use within the TAP TSI, the changes shall be made so as to remain as close as possible to the implemented TAP TSI in order to achieve optimum synergies.

7.3. Specific Cases

7.3.1 Introduction

The following special provisions are permitted in the specific cases below:

(a) "P" cases: permanent cases;

(b) "T" cases: temporary cases, where it is planned that the target system is reached in the future.

(c) 'T1' cases: 'temporary' cases, where the target system shall be reached by 31 December 2025.

7.3.2 List of specific cases

7.3.2.1 Specific case Company code ("P")

For actors exchanging data with actors located outside EEA, company codes with 4 digits shall be allocated

7.3.2.2 Specific case Company code ('T1')

The usage of numerical codes according to the reference file of the coding for all IM, RUs, logistic providers and fleet managers (chapter 4.2.11.1), so called company codes, is mandatory. The Agency will allocate, store and maintain Company codes from 1 January 2026.

Appendix I - List of technical documents

The version in force of these technical documents is published on the website of the Agency.

No	Reference	Title
1	ERA-TD-100	TAF TSI — ANNEX A.5:FIGURES AND SEQUENCE DIAGRAMS OF THE TAF TSI MESSAGES
2	ERA-TD-101	TAF TSI — Annex D.2: Appendix A (Wagon/ILU Trip Planning)
3	ERA-TD-102	TAF TSI — Annex D.2: Appendix B — Wagon and Intermodal Unit Operating Database (WIMO)
4	ERA-TD-103	TAF TSI — Annex D.2: Appendix C — Reference Files
5	ERA-TD-104	TAF TSI — Annex D.2: Appendix E — Common Interface
6	ERA-TD-105	TAF TSI — Annex D.2: Appendix F — TAF TSI Data and Message Model

Appendix II - Glossary

Term	Description
Allocation body	Body responsible for path allocation, which is independent in its legal form, organisation and decision-making from any railway undertaking (Directive 2012/34/EU of the European Parliament and of the Council).
Applicant	A railway undertaking or an international grouping of railway undertakings or other persons or legal entities, such as competent authorities under Regulation (EC) No 1370/2007 of the European Parliament and of the Council and shippers, freight forwarders and combined transport operators, with a public-service or commercial interest in procuring infrastructure capacity (Directive 2012/34/EU (3).
Basic parameter	Means any regulatory, technical or operational condition which is critical to interoperability and requires a decision in accordance with the procedure laid down in Article 21(2) before any development of draft TSIs by the joint representative body.
Combined Transport (CT)	Intermodal transport constituted by rail and road transport mode.
Company Code (CC)	Company Codes (CCs) identify railway stakeholders for the purpose of telematic application services.
Competent authority	A public authority, agency or other body which is competent to perform tasks pursuant to the legal acts referred to in Article 2(1) and for which access to regulatory information is necessary, such as checking, enforcing, validating or monitoring compliance on the territory of a Member State.
Consignee	Party to whom the goods are to be delivered.
Consignment	Goods sent under a single contract of carriage.
Consignment note	Electronic record or paper document which records the contract of carriage.
Consignment order	A subset of the consignment note which shows the relevant information for a RU, needed to carry on the transportation during its responsibility until handover to a next RU.
Consignor	Party which, by contract with a Service Integrator, consigns or sends goods with the carrier, or has them conveyed by him.
Customer	Means a person or entity buying rail freight transport services.
Decryption	Means the converting of encrypted data back into their original form.
Delay	Means the time difference between the time the passenger was scheduled to arrive according to the published timetable and the time of his/her actual or expected arrival.

Direct train	A train with related wagons which runs between two transshipment points (initial source — final destination) without intermediate marshalling.
electronic freight transport information' or 'eFTI	A set of data elements that are processed by electronic means for the purpose of exchanging regulatory information among the economic operators concerned and between the economic operators concerned and competent authorities.
Encryption	Encoding of messages Decryption: converting encrypted data back into original form.
Estimated Time of Arrival (ETA)	Estimated Time of Arrival (at reporting point). The estimated time of arrival (ETA) is the time when the unit is expected to arrive at a certain place. Estimates can be based on production plans (predictions) and/or stochastic computation.
ETI	Estimated Time of Interchange of wagons from one RU to another.
ETP	Estimated Time of Pick-Up of loading units (at arrival intermodal terminal).
Forecast Time	Estimated time of arrival, departure or passing time of a train.
Forecast point	Means a location for which the forecast is generated. It may relate to arrival, departure, passage or handover.
Handover point	Location of train's journey or between two paths where the responsibility for planning (including allocation) and/or operation changes from one IM to another.In the context of Planning it's called as Planning handover point, and in the context of Operations, it's called as Operational handover point.
Infrastructure manager (IM)	Means some body or firm responsible in particular for establishing, managing and maintaining railway infrastructure, including traffic management and control-command and signalling; the functions of the infrastructure manager on a network or part of a network may be allocated to different bodies or firms. Where the infrastructure manager, in its legal form, organisation or decision-making functions, is not independent of any railway undertaking, the functions referred to in Sections 2 and 3 of Chapter IV shall be performed respectively by a charging body and by an allocation body that are independent in their legal form, organisation and decision-making from any railway undertaking. (Directive 2012/34/EU (3)). An IM can assume the roles ResponsibleIM and/or PlanningIM.
IM Entry Point	The location where the Combined Transport train leaves the intermodal terminal area and enters the first public IM network.
Interchange	Means the transfer of control from one railway undertaking to another for practical operational, safety and liability reasons.
Interchange point	Location of train's journey or of a path where the transfer of responsibility for the whole train from one Responsible RU to another Responsible RU takes place.
Intermodal terminal	Location which provides the space, equipment and operational environment under which the loading units (freight containers, swap bodies, semi-trailers or trailers) transfer takes place.

Intermodal transport	The movement of goods in one and the same loading unit or vehicle which uses successively several modes of transport without handling of the goods themselves in changing modes.
~~Intermodal Unit~~ Intermodal Loading Unit	Containers, swap bodies and semi-trailers suitable for combined transport.
Keeper	The legal entity who being the owner or having the right to dispose of it, exploits an asset economically in a permanent manner as a means of transport and is registered as such in the respective registers.
Lead Railway Undertaking (LRU)	Applicant/RU, which is responsible to organise and manage the transport line according to the customer's commitment. It is the single point of contact for the customer. If more than one Railway Undertaking is involved in the transport chain, the LRU is responsible for the co-ordination of the various Railway Undertakings the harmonization of train's journey including the various path requests.
Path	Path means the infrastructure capacity needed to run a train between two places over a given time-period (Route defined in time and space).
Primary data	Basic data as reference data input for messages or as the basis for functionality and calculation of derived data.
Place of departure	Place from which a means of transport is scheduled to depart or has departed.
Planning IM (PIM)	The Planning IM (PIM) is the Infrastructure Manager who is responsible for elaboration and allocation of a path. The responsibility area of PIM is defined by handover points. In most cases, the Responsible IM (RIM) will be the same entity as the Planning IM. However, for some locations and/or some trains, path elaboration and also traffic monitoring in operations may also be delegated to another IM.
Primary Location Code (PLC)	Primary Location Codes (PLCs) identify locations on a railway network. The Infrastructure Manager owning the railway network manages the PLCs. These are normally important locations, where trains start, end, stop, run through or change line.
Railway Undertaking (RU)	Railway undertaking (Directive (EU) 2016/798): means railway undertaking as defined in point (1) of Article 3 of Directive 2012/34/EU, and any other public or private undertaking, the activity of which is to provide transport of goods and/or passengers by rail on the basis that the undertaking must ensure traction; this also includes undertakings which provide traction only. A RU can assume the roles Lead RU and/or Applicant and/or Responsible RU.
Regulatory information	Means information, whether or not presented in the form of a document, that is related to the transport of goods in the territory of the Union, including of goods in transit, which is to be made available by an economic operator concerned in accordance with the provisions referred to in Article 2(1) in order to prove compliance with the relevant requirements of the acts laying down those provisions.
Reporting point	A location where the responsible IM provides reports about the train run.

Repository	A repository is similar to a database and data dictionary, however it usually encompasses a comprehensive information management system environment. It must include not only descriptions of data structures (i.e. entities and elements), but also metadata of interest to the enterprise, data screens, reports, programs, and systems. Typically it includes and internal set of software tools, a DBMS, a metamodel, populated metadata, and loading and retrieval software for accessing repository data.
Responsible Applicant (RA)	The RA is the applicant/customer and contractor as well as the single point of contact for respective IM (infrastructures manager) in the whole planning process phase. The main task of the role RA is to request the booking of capacity to an IM. The RA does not need to be a Railway Undertaking, it can also be another entity, which is able and permitted to book capacity.
Responsible IM	The Responsible IM (RIM) is the Infrastructure Manager who is responsible for all operational handling of trains and paths on its network.
Responsible RU (RRU)	The RRU is responsible for the run of the train in operation phase, for the whole journey or a section of the journey. If more than one RRU is involved in operating the train, the responsibility is transferred from one RRU to the next RRU at the interchange point.
Service Disruption	Means the unplanned stop of a train during operation, without any information regarding the continuation of the journey
Service Integrator	Any body or undertaking, which has the contract with customers for railway transport. He is preparing consignment note , managing capacity on block trains etc.
Shipment	Wagons or intermodal loading units transported under the terms of a single consignment, irrespective of the quantity or number of containers, packages, or pieces.
Short notice path request	Individual request for a path referring to in Directive 2012/34/EU as ad-hoc path request due to additional transport demands or operational needs.
Stakeholders	Any person or organisation that is performing a service in relation to a train run.
Terminal Operator	An organisational entity, which is has been made responsible for the management of a marshalling yard, multimodal or intermodal terminal, port terminal.
Train Estimated Time of Arrival (TETA)	Estimated Time of Arrival (at destination). The estimated time of arrival (ETA) is the time when the train is expected to arrive at a certain place. Estimates can be based on production plans (predictions) and/or stochastic computation.
Timetable	Means the list of commercial transport services offered by a railway undertaking during a given time interval.

Train	A train is defined as (a) traction unit(s) with or without coupled railway vehicles with train data available operating between two or more defined points.
Trip plan	For wagon or Intermodal unit shows the planned reference trip of the wagon/Intermodal unity.

Appendix III - Tasks to be undertaken by the TAF/TAP National Contact Point (NCP)

(1) Act as point of contact between ERA, the Telematics Advisory Committee, and railway stakeholders and relevant associations in the Member State in order to ensure that the railway stakeholders are engaged with TAF and TAP and are aware of general developments and decisions of the Telematics Advisory Committee.

(2) Communicate the TAF and TAP TSI implementation and relevant operation concerns, views and issues of the railway stakeholders in the Member State to the ERA TAF and TAP Implementation Cooperation Group for analysis, and to be reported to the Telematics Advisory Committee via the co-chairs.

(3) Liaise with the Member State Railway Interoperability and Safety Committee (RISC) member ensuring that the RISC member is briefed on national issues relating to TAF and TAP prior to each RISC meeting and ensuring that RISC decisions relating to TAF and TAP are communicated appropriately to affected railway stakeholders .

(4) The Member State ensures that NCP details are made publicly available to all railway stakeholders and relevant associations.

(5) To the extent that railway stakeholders in the Member State are known, make them aware of their obligations under the TAF and TAP regulations and that they must comply with them.

(6) Work with the Member State to ensure that a National Allocation Entity is appointed. The NCP shall report the contact details of the appointed entity to ERA for appropriate distribution among railway stakeholders and relevant associations.

(7) Facilitate information sharing between the railway stakeholders and relevant associations in the Member State.

Appendix IV - Accuracy of train running forecast and wagon ETI/ETA information

Train running forecast and shipment ETI/ETA information is a prediction for the time of arrival of a train or a shipment at a predefined topographical forecast point of a journey, what could be an intermediate point or destination. The forecast serves to plan onward operations in a specific train service or onward connections. As the train forecast or shipment ETI/ETA information is an estimate, which is not 100% accurate, an operator, who intends to use the information for planning, needs to be aware of the accuracy and reliability of the information in order to place confidence on the information.

The assessment of the predicted value's accuracy can be done only after the train/shipment has arrived at the forecast points and hence based on historic data. For this assessment, the following definitions are applied:

- **Absolute error** is the (absolute) value of the difference between real-time of arrival and forecasted time at the forecast point.
- **Relative error** brings the absolute error in relation to the remaining journey time to the reporting point. The relative error therefore is a ratio (or percentage). The relative error is equal to the absolute error divided by remaining train journey time, which is the difference between the time of prediction and real-time of train arrival to the forecast point.
- **Accuracy** is the complement of the relative error to 1 (100%).

The assessment of the information reliability needs to be based on a group of previous train services for which the relevant statistical values of the errors, relative errors or accuracies with their stochastic probability can be computed.

The train running forecast and wagon ETI/ETA are sent via the TrainRunningForecastMessage and the Wagon ETI/ETA-Message. The first message is sent from IM to RU and from IM to next IM, the second message between RUs or between RUs and Lead RU. That is not limitative: the TrainRunningForecastMessage can also be used by other actors (e.g. IM sends the TRI to a company specialized in forecast calculation which sends back the result via TRF to IM) and the Wagon ETI/ETA-Message can be sent between Lead RU and the Customer or the Terminal Operator.

The train running forecast message and the wagon ETI/ETA message in its simplest form derive from the time originally planned in the timetable plus/minus the deviation from the timetable as accrued during a train service, the so-called linear time shifting method. This method is commonly applied by some Infrastructure Managers while others are using their own algorithms. Railway Undertakings may apply other methods. Also, algorithms using for example machine learning methods may be applied to compute forecasts. It is therefore required that the recipient of a forecast can assess its source and reliability.

The definition of the mandatory structure of TrainRunningForecastMessage and Wagon ETI/ETA message and the elements to be followed are described in the document 'TAF TSI — Annex D.2: Appendix F — TAF TSI Data and Message Model' listed in Appendix I.