

Making the railway system
work better for society.

Mr. Harald Reisinger
Chief Information Officer
RailNetEurope
Oelzeltgasse 3/9
1030 Vienna
Austria

Valenciennes, 24th September 2021

TAF TSI Compliance Results – CEF Grant Agreement INEA/CEF/TRAN/M2016/1355262

To whom it may concern,

I confirm and certify herewith that the following TAF TSI functionalities implemented by the organization RailNetEurope (Austria), are compliant with the appropriate provisions of the TAF-TSI Regulation No. 1305/2014 and its Technical Documents, with scope limitations and conclusion comments reported in this document.

Details of the Action:

Name of the Action:	Shifting Freight2Rail - Innovative international TT process and increased real time t&t for customer satisfaction"
No. of the Action:	2016-ATTM-0043-S
No. of the Grant Agreement:	INEA/CEF/TRAN/M2016/1355262
Duration of the Action:	From 01/07/2017 until 31/12/2020
Verified Milestones/Activities:	A2/2.2: Development and adjustments of interfaces with national railway systems based on TAF/TAP TSI adaptations A2/2.5: TAP/TAF TSI adaptations for Short-Term Path (STP) request A4/4.1: Additional requirements for TAF TSI CRD update defined A4/4.3: Implementation of Common Train ID number

The detailed results of the verification process are concluded as follows:

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1. Sub-activity 2.2: Development and adjustments of interfaces with national railway systems based on TAP/TAF TSI adaptations

1.1. Description of the sub-activity (ref. Grant Agreement -see Table 2).

Page 13: *The TTR project requires a centralized IT landscape comprised of all existing and new RNE IT tools, to ensure stable communication about the available capacity between all involved stakeholders and to overcome the problem of manual interfaces and limited data quality. The national systems dealing with timetabling process need to be connected to the new tools in the IT landscape. Also, the existing interfaces, based on TAF/TAP TSI standards, between the national systems and the existing IT tools need to be reviewed and adjusted to the IT landscape.*

Therefore, the main objective of this sub-activity is to design, implement and test new interfaces and to adjust the current ones to ensure compatibility between the centralized IT landscape and the existing national systems.

The sub-activity encompasses the following tasks:

1. *Definition of the requirements of a new interface schema for the old and new connections according to the updated timetabling process.*
2. *Preparation of an implementation plan (compliant with TAF/TAP TSI standards) for adaption of existing and creation of new interfaces to match the centralized IT landscape.*
3. *Preparation of the technical specifications for the new interface schema.*
4. *Preparation of adaption specifications of existing interfaces based on the new interface scheme.*
5. *Dissemination and approval of the new and the adapted old interface schema to ensure compatibility to already connected systems.*
6. *Establishment of new interfaces between new tools in the international IT landscape and the national systems according to the new scheme.*
7. *Pilot tests of the new interfaces with interested IMs, ABs, RFCs, and Applicants. The tests include endurance testing, semantic checks, disruption test, and long-term testing.*
8. *European wide roll-out of interface and possibility to connect with national systems by the end of 2020.*

ERA will be requested to verify the compliance of the deliverable(s) of this sub-activity with TAF/TAP TSIs. Copies of completion protocols and ERA verifications will be provided as means of verification. The beneficiary will provide the Agency - upon request - with copies of the messages produced by the applications running in production.

ARTICLE I.5:

<i>Milestone number</i>	<i>Milestone description</i>	<i>Indicative completion date</i>	<i>Means of verification</i>
5	<i>A2 (sub-activity 2.2) Implementation plan and technical specifications of the new interface schema finalised</i>	30/11/2019	<i>Copy of PCS Change Control Board/Technical Board/RNE GA approval. Copies of ERA verifications and completion protocols.</i>

1.2. Evidence

RailNetEurope sent to the European Union Agency for Railways on the 28th of May, 4th of June and 9th of September 2021 a compliance verification application, accompanied with following deliverables:

TAF TSI function / specification	Content description
chapter 4.2.2. Path Request and path allocation	<ul style="list-style-type: none"> PCS and TAF TSI scheme compliant messages PCS TAF compliance verification cover document
chapter 4.2.2.2 Path Request message	<ul style="list-style-type: none"> PCS TAF compliance verification cover document PRM 233710 GreenCargo Trafikverket V00.xml PRM 233710 GreenCargo Trafikverket V01.xml
chapter 4.2.2.3 Path Details message	<ul style="list-style-type: none"> PCS TAF compliance verification cover document PDM 233818 GYSEV Cargo VPE.xml 1340_233818_v9.pdf
chapter 4.2.2.4 Path Confirmed message	<ul style="list-style-type: none"> PCS TAF compliance verification cover document PCM 233898 GYSEV Cargo Trafikverket.xml
chapter 4.2.2.5 Path Details Refused message	<ul style="list-style-type: none"> PCS TAF compliance verification cover document PDRM 234061 GYSEV cargo Trafikverket.xml

Table 1 Sub-activity 2.2 verification deliverables

1.3. Scope and findings

The messages are implemented based on the legal text TAF Regulation defined in the Chapter 4.2.2 Path . Please find the link to the new version from of 26 March 2021:

<https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32021R0541&from=EN>

The detailed technical specification is included in the ANNEX D.2 : APPENDIX F – TAF TSI DATA AND MESSAGE MODEL:

https://www.era.europa.eu/sites/default/files/filesystem/taf/technical_documents/baseline_3.0.0/era_technical_document_taf-td-105_d_2_appendix_f_3.0.0.pdf

The example messages were created based on the version 2.5.0 of the message catalogue of the TAF TSI message catalogue.

PathRequestMessage:

The first deliverable contained a PathRequestMessage “PRM 233710 GreenCargo Trafikverket V00.xml”. In the message header it was indicated, that the message was created based on the TAF TSI message scheme version 2.5. However the schema validation failed, due to the incorrect usage of the element `<ns1:BrakeType>0</ns1:BrakeType>`. The element has been already defined based on the version 3.0.0 TAF TSI message catalogue, leading to an incorrect message. The same error has been discovered “PRM 233710 GreenCargo Trafikverket V01.xml”.

A correct message PRM 233710 GreenCargo Trafikverket V00.xml, based on the TAF TSI data catalogue version 2.5.0, was provided on 15.9.2021 to ERA.

Path Details message:

The provided Path Details message is compliant with the TAF TSI data catalogue version 2.5.0.

Path Confirmed message:

The provided Path Details message is compliant with the TAF TSI data catalogue version 2.5.0.

Path Details Refused message:

The provided Path Details message is compliant with the TAF TSI data catalogue version 2.5.0.

ReceiptConfirmationMessage

The provided Receipt confirmation message is not compliant with the TAF TSI data catalogue 2.5.0. The element TypeOfRequest contains a wrong number 5, which is not allowed. The allowed numbers are 1 - Path study, 2 - Path request and 3 - Path Modification.

1.4. Conclusions

The deliverable for this milestone is covering the scope of the Grant agreement. Major functions are in full compliance with the provisions of the TAF regulation (EU) 2021/541. Minor errors have been identified in the message ReceiptConfirmationMessage which is not valid compared with the message data catalogue version 2.5.0.

The following messages from the TAF TSI data catalogue concerning the path management could not be checked:

- *PathCanceledMessage*
- *PathNotAvailableMessage*

Those messages serving for the purpose of the path management, are part of the TAF TSI but were not delivered and consequently not checked.

It is recommended to verify the version management of the TAF TSI schemes, when creating the outgoing messages and to process the required schema changes firstly in the ERA and then in the European Rail Sector's Change Control Management process. As the Agency has seen the PathRequestMessage in the first deliverable was not in line with the version 2.5.0. It should be guaranteed that in the production system only those messages can be created, which are compliant with the TAF TSI message data catalogue.

2. Sub-activity 2.5: TAF/TAP TSI adaptations for Short-Term Path (STP) request

2.1. Description of the sub-activity (ref. Grant Agreement -see Error! Reference source not found.).

Page 15: *“The purpose of the TAF/TAP TSI is to define Europe-wide procedures and interfaces between all types of railway industry agents. The TAF/TAP TSI framework reflects the currently used timetabling process. As this process will be changed and new steps, agents, and sub-processes will appear, the TAF/TAP TSI framework (messages, workflow and data structure) needs to be changed as well. In addition, the common interface within the TAF/TAP TSI framework provides a standard connection possibility between national systems and international capacity tools (PCS, TCR). It is not designed according to the requirements for provision of real-time information on network capacities. Therefore, it is necessary to update the TSI messages provided by the TAF/TAP TSI workflow.*

The main objective of this sub-activity will be to assess the TAF/TAP TSI framework and to modify the TAF/TAP TSI workflow schema according to the redesigned timetabling process.

The sub-activity encompasses the following tasks:

1. *Review of the existing message workflow and message structure.*
2. *Review of the data model for reference files in order to fulfill the new requirements originating from the TTR project.*
3. *Adaption of the TAF/TAP TSI process to the redesigned timetabling process. This shall cover the entire interface description, including security layers and the common reference database to insure full interoperability.*
4. *Change of the schema for TAF/TAP TSI interface by the TAF/TAP Change Control Board.*

The main deliverable of this sub-activity will be the updated schema for the TAF/TAP TSI interface, which will ensure European rail data interoperability.

ERA will be requested to verify the compliance of the deliverable(s) of this sub-activity with TAF/TAP TSIs. Copies of completion protocols and ERA verifications will be provided as means of verification. The beneficiary will provide the Agency - upon request - with copies of the messages produced by the applications running in production.”

ARTICLE I.5:

<i>Milestone number</i>	<i>Milestone description</i>	<i>Indicative completion date</i>	<i>Means of verification</i>
14	<i>A2 (sub-activity 2.5) Review report delivered. Updated schema for TAF/TAP TSI interface approved</i>	30/11/2019	<i>Copy of PCS Change Control Board/Technical Board/RNE GA approval. Copies of ERA verifications and completion protocols.</i>

2.2. Evidence

RailNetEurope sent to the European Union Agency for Railways on the 28th of May, 4th of June and 9th of September 2021 a compliance verification application, accompanied with following deliverables:

TAF TSI function / description	Content name	Id
4.2.2 Path Request and path allocation	4.2.2.1 n/a ("Preliminary remarks")	n/a
	4.2.2.2 PathRequestMessage_C1.xsd	1
	4.2.2.3 PathDetailsMessage_C1.xsd	2
	4.2.2.4 PathConfirmedMessage.xsd	3
	4.2.2.5 PathDetailsRefusedMessage.xsd	4
	4.2.2.6 PathCanceledMessage.xsd	5
	4.2.2.7 PathNotAvailableMessage.xsd	6
	4.2.2.8 ReceiptConfirmationMessage.xsd	7
Grant Agreement	2017-10-31_Grant_Agreement_2016-AT-TM-0043-S	8
Informative	210907-ERA_summary-Milestones_and_Deliverables_V1.0	9
	M1_3_5_8_9_12_14_16_19_21_26_28_32_36-Decision_list_RNE_GA_20May2020.pdf	10
	PCS TAF Compliance document v1.0 20210507	13

Table 2 Sub-activity 2.5 verification deliverables

2.3. Scope description

Applicant has delivered for compliance check the .xsd schema files for the TAP/TAF TSI interface corresponding to the complete ch. 4.2.2 Path Request and path allocation function relevant to the „PCS“ path allocation tool. Schema covered a full set of messages as listed in the Table 2. Set delivered, according to applicant belongs to the overall „Sector Schema 2.4.1.0“. The Agency performed a compliance check¹ against the official TAF data catalogue version baseline 2.5.0, see:

<https://www.era.europa.eu/content/technical-documents-baseline-250>.

Applicant has also informed the Agency that the Milestone 14 of the project has been approved by the RNE GA. Document provided to support this information is listed in the Table 2 under item 10. Additionally, coordination meeting with Applicant, on September 13th 2021 helped to determine the applicable evidence per Milestone, as presented in this report.

2.4. Conclusions

Provided schema files mentioned in the Table 2 under ID1-7, correspond to the complete TAF TSI 4.2.2 Path Request and path allocation function and are compliant with the TAF TAF data catalogue version baseline 2.5.0. The files subject to check are annexed to this report as an archive file.

¹ generated sample messages containing mandatory elements were validated for compliance with the TAF data catalogue. Checked with Altova XMLSpy Enterprise Edition version 2020 release 2 sp1 (x64)

3. Sub-activity 4.1: Additional requirements for TAF TSI CRD update defined

3.1. Description of the sub-activity (ref. Grant Agreement -see Table 2).

Page 19: *The CCS is under the umbrella of RNE. It consists of the TAF TSI Common Interface and the CRD containing TAF TSI Reference Files. The CRD² is kept up to date by the IMs and contains relevant information on companies (IMs, RU, etc.) and locations (rail stations, junctions, etc.). Each company and location has a unique number in the CRD. In order to use the data from the CRD, the RNE IT applications (TCR, PCS, TIS, etc.) need to be connected to the CRD.*

The objective of this sub-activity will be to: 1) to create an European CRD for infrastructure data with reliable and verified data, 2) to extend the CRD with a network model i.e. to include information on how the train stations are connected (e.g. single track, double track, border stations, etc.), 3) to synchronize the data through interface connection with national systems, through the TAF TSI interface.

The following tasks will be performed:

- 1. Definition of additional requirements for the CRD update.*
- 2. Update of the CRD based on the defined requirements and inclusion of a network model.*
- 3. Changes in the RNE IT tools (TIS, PCS, CIP, etc.) to prepare for the connection to the CRD to be able to use the data from the CRD.*
- 4. Connection of the RNE IT tools to the CRD based on TAF TSI standards.*
- 5. Enable the connection between the CRD / "Big Data" and the national systems (the required adaptations in the national systems are not part of the Action) based on TAF TSI standards.*
- 6. Preparation of interface descriptions.*

This sub-activity is a pre-condition for sub-activity 4.2 because the CRD will establish a common baseline for RNE IT tools and that will be the infrastructure information.

ERA will be requested to verify the compliance of the deliverable(s) of this sub-activity with TAF/TAP TSIs. Copies of completion protocols and ERA verifications will be provided as means of verification. The beneficiary will provide the Agency - upon request - with copies of the messages produced by the applications running in production.

This sub-activity will contribute to the achievement of the goal of having reliable, verified and interchangeable data to be used in all other RNE IT applications fed by national systems.

ARTICLE I.5:

<i>Milestone number</i>	<i>Milestone description</i>	<i>Indicative completion date</i>	<i>Means of verification</i>
<i>27</i>	<i>A4 (sub-activity 4.1) Additional requirements for TAF TSI CRD update defined</i>	<i>30/05/2018</i>	<i>Copy of RNE GA, TAF TSI Joint Support Group approval. Copies of ERA verifications and completion protocols.</i>

² see <https://ccs.rne.eu/crd/> (Central Reference File Database - CRD)

3.2. Evidence

RailNetEurope sent to the European Union Agency for Railways on the 28th of May, 4th of June and 9th of September 2021 a compliance verification application, accompanied with following deliverables:

TAF TSI function / specification	Content description
4.2.10.1. Reference Files	Copy of RNE GA, TAF TSI Joint Sector Group approval: <ul style="list-style-type: none"> • General Assembly; Decision No. 1.2.2 (5/21) • CCS CCB 4.1.2 (10/19) • Copies completion protocols • TEG Reference Files meeting, Agenda point 3 (02/19)

Table 3 Sub-activity 4.1 verification deliverables

3.3. Scope and findings

The CRD is the reference implementation of the TAF/TAP TSI and therefore by definition compliant with TAF/TAP TSI. RNE is managing the TAF/TAP Sector Management Office (SMO). The justification that all the European Rail Primary Location Codes are publicly available at RailNetEurope's Common Components website is the attached common announced from Rail Net Europe and the European Union Agency for Railways from the 01st September 2019.

CRD is implemented based on the legal text TAF Regulation defined in the Chapter 4.2.10.1 Reference Files. Please find the link to the new version from of 26 March 2021:

<https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32021R0541&from=EN>

The detailed technical specification is included in the ANNEX D.2 : APPENDIX C - REFERENCE FILES:

https://www.era.europa.eu/sites/default/files/filesystem/taf/technical_documents/baseline_3.0.0/era_technical_document_taf-td-103_d_2_appendix_c.pdf.

In addition, based on requirements gathered and validated by RNE, the "D27a-CRD Improvements Report" from RNE (part of the delivery to ERA) contains the CDR's enhancements introducing the

- *Compliance to GDPR,*
- *Free of charge WEB access to CRD,*
- *Companies Self-Authentication of New Users,*
- *New Lists of National Contact Points and National Allocation Entities,*
- *New Processes for*
 - *Primary Location Code Request,*
 - *Subsidiary Location Code Request,*
 - *Primary Location Proposal.*

Please find in the annexed file as proof of evidence some company and location examples for reference files as stored in CDR in the current period (2021).

3.4. Conclusions

The deliverable for this milestone is covering the scope of the Grant agreement and is compliant with the provisions of the TAF regulation (EU) 2021/541.

4. Sub-activity 4.3: Implementation of Common Train ID number

4.1. Description of the sub-activity (ref. Grant Agreement -see Table 2).

Page 21: *For a considerable amount of time, European railways have had a major problem in identifying trains and paths on their networks. During the analysis of the message exchange in TAF TSI and existing international systems, it became apparent that identifiers are needed for all elements of the train live cycle from planning to operation, from origin to destination.*

The objective of this sub-activity is piloting and roll-out of a Common Train ID (defined in the TAF/TAP TSI) which will be used in all phases relevant for train runs, by all stakeholders (RUs, IMs, etc.). This can be done either by using existing planning numbers such as International Train Numbering Database (ITNDB) and/or PCS, or to develop an application that will be able to generate a unique Common Train ID number.

The following tasks will be carried out:

1. *Assessment of the two potential approaches mentioned above.*
2. *Definition of a process for a Common Train ID generation.*
3. *Implementation based on the chosen approach (e.g. integration of ITNDB tool in the newly developed application for generation of train ID or as a module into PCS).*
4. *Pilot for the creation and usage of the Train ID (based on TAF TSI) considering short-term path requests, and preparation of a report on the pilot with interested IMs. The number of pilots shall be defined by the project management.*
5. *Roll-out of the Common Train ID in 2021.*

The deliverable of this sub-activity is a Common Train ID covering the whole train life cycle.

ERA will be requested to verify the compliance of the deliverable(s) of this Action with TAF/TAP TSIs. Copies of completion protocols and ERA verifications will be provided as means of verification. The beneficiary will provide the Agency - upon request - with copies of the messages produced by the applications running in production.

ARTICLE I.5:

<i>Milestone number</i>	<i>Milestone description</i>	<i>Indicative completion date</i>	<i>Means of verification</i>
35	<i>A4 (sub-activity 4.3) Process for train numbering and Train ID generation approved</i>	31/12/2018	<i>Copy of RNE GA approval. Copies of completion protocols and ERA verifications</i>
37	<i>A4 (sub-activity 4.3) Pilot test completed and report about the Train ID pilot finalised. European wide roll-out started</i>	31/12/2020	<i>Copy of TAF/TAP TSI Joint Support Group approval of the report. Copies of completion protocols and ERA verifications</i>

4.2. Evidence

RailNetEurope sent to the European Union Agency for Railways on the 28th of May, 4th of June and 9th of September 2021 a compliance verification application, accompanied with following deliverables:

TAF TSI function / specification	Content description – Milestone 35
4.2.2. Path Request and path allocation 4.2.3. Train Preparation 4.2.4. Train Running Information and Train Running Forecast 4.2.5. Service Disruption Information 4.2.6. Shipment ETI/ETA 4.2.7. Wagon Movement	Copy of RNE GA approval. Copies of completion protocols: <ul style="list-style-type: none"> • General Assembly; Decision No. 1.2.2 (5/21) • D35a-Process for train numbering and train id generation • D35b-First and Last Mile Requirements

Table 4 Sub-activity 4.3 verification deliverables (M35)

TAF TSI function / specification	Content description – Milestone 37
4.2.2. Path Request and path allocation 4.2.3. Train Preparation 4.2.4. Train Running Information and Train Running Forecast 4.2.5. Service Disruption Information 4.2.6. Shipment ETI/ETA 4.2.7. Wagon Movement	Copy of TAF/TAP-TSI Joint Sector Group approval of the report. Copies of completion protocols: <ul style="list-style-type: none"> • TAF/TAP TSI JSG; Decision No. 3b (25.6.2020) – Meeting 8.7.2020 • ERA - TAF bulletin 2020 – Page 3 • TAF path request messages produced by enhanced RNE PCS application: <ul style="list-style-type: none"> • PCM 233898 GYSEV Cargo Trafikverket.xml • PRM 233710 GreenCargo Trafikverket V00.xml • PDM 233818 GYSEV Cargo VPE.xml • D37a-2020-06-23-TEG-Planning-Final-JS Pilot Programme • D37a-JS Pilot last report on TEG Planning from CMS RNE.

Table 5 Sub-activity 4.3 verification deliverables (M37)

4.3. Scope and findings

Milestone 35

The document “D35a-Process for train numbering and train id generation” describes in a multi IM, multi RU and multi country environment the:

- *Definition of Train numbers*
 - *Commercial train number (CTN)*
 - *Planned train number (PTN)*
 - *Infrastructure train number (ITN)*
 - *Operational train number (OTN)*
 - *Their place in the TAF process, TAF messages and existing sector applications such as RNE TIS*
- *Train numbering process based on structure of UIC leaflet 419-2*
- *Introduction of a common Train ID (requirements, implementation, message structure)*
- *OTN & Train ID implementation in PCS.*

This document describes clearly the analysis and conclusions for the process for train numbering and Train ID generation so that it can be processed and exchanged in IT systems.

The file “D35b-First and Last Mile Requirements” gives in addition a detailed overview on how existing TAF train running messages must be enriched when a transport chain has to involve subsidiary locations or prts / terminals. This involves also the addition of new TAF acotrs (such as forwarders, terminal operators etc) and of new train running message elements (such as Type code 57 (intermodal Terminal), coding of terminals in the CRD, terminal Loading Status, handling of subsidiary codes etc).

As a proof of evidence an amended train running message from TAF has been provided – among others – by RNE to ERA with amended location **subsidiary** code for a terminal – see the annexed file.

Milestone 37

The various documents delivered by RNE to ERA describe in a multi IM, multi RU and multi country environment the usability of the developed unique train ID in the existing TAF TSI landscape and IT solutions (in particular the RNE PCS), even though some adjustments might be needed for the use of the TAF Common Interface. These proofs have been delivered by the participating RUs, IMs and Allocation Bodies.

The Train ID pilot project was derived from structured use cases and transformed into test cases for the amended PCS system.

The delivered XML messages (as outcome of the process and exchanged between the PCS users) were tested and ccesfully validated against the [official TAF TSI XSD baseline V2.5](#).

As a proof of evidence an amended train path request message from TAF has been provided – among others – by RNE to ERA with amended new train ID – see the annexed file.

4.4. Conclusions

- *The deliverable for the milestone 35 is covering the scope of the Grant agreement.*
- *The deliverable for the milestone 37 is covering the scope of the Grant agreement and is compliant with the provisions of the TAF regulation (EU) 2021/541.*

5. List of Annexes

Annex 1. Messages as proof of evidence

Annex 2. Schema as proof of evidence



Mickael Varga
Railway Systems Unit
Project Officer
Tel: +33 327 096 508
mickael.varga@era.europa.eu



Stefan Jugelt
Railway Systems Unit
Project Officer
Tel: +33 327 096 753
stefan.jugelt@era.europa.eu



Filip Skibinski
Railway Systems Unit
Project Officer
Tel: +33 327 096 606
filip.skibinski@era.europa.eu