Report

2023 TAF TSI IMPLEMENTATION KEY PERFORMANCE INDICATOR (KPI) WORKING DOCUMENT REPORT OF THE EUROPEAN UNION AGENCY FOR RAILWAYS

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Document History

Version	*Date*	*Comments*
0.1	05/07/2024	1st draft for the TAF TSI Implementation Cooperation Group (ICG) comments
0.2	26/08/2024	Inclusion of ICG members' comments (from NCP LU, NCP SK and NCP CH).

| 1.0 | 29/08/2024 | Final release |

Contents

Abbreviations

Abbreviation	Definition
CI	Common Interface
DI	Degree of Implementation
EC	European Commission
ERA	European Union Agency for Railways (also referred to as Agency)
ERFA	European Rail Freight Association
GCU	General Contract for Use of Wagons
IM	Infrastructure Manager
IRG	Implementation Reporting Group
JSG	Joint Sector Group
KPI	Key Performance Indicator
NCP	National Contact Point
NAE	National Allocation Entity
PLC	Primary Location Code
RNE	Rail Net Europe
RSRD	Rolling Stock Reference Database
RU	Railway Undertaking
TAF	Telematics Applications for Freight
TIS	Train Information System developed by RNE
TRI	Train Running Information
TSI	Technical Specification for Interoperability
TTT	TAF TAP TSIs
UIC	Union Internationale des Chemins de fer
UIP	International Union of Wagon Keepers
WK	Wagon Keeper

Reference documents

Ref. N°	Title	Reference	Version
(1)	TAF and TAP TSI Master Plans	TAF Master Plan – v4.0 TAP Master Plan – v1.0	17.01.2013 28.01.2013
(2)	ERA TAF TSI Implementation Cooperation Group held on 9th March 2022	Minutes	9.03.2022

Reference legislation

Ref. N°	Document Reference	Title	Last Issue
[1]	Left blank intentionally		
[2]	TAF TSI Regulation No 1305/2014	Commission Regulation (EU) No 1305/2014 of 11 December 2014 on the technical specification for interoperability relating to the telematics applications for freight subsystem of the rail system in the European Union and repealing the Regulation (EC) No 62/2006. Amended by the Commission Implementing Regulation (EU) 2021/541 of 26 March 2021.	26.03.2021
[3]	Corridor Regulation No 913/2010	Regulation (EU) No 913/2010 of the European Parliament and of the Council of 22 September 2010 concerning a European rail network for competitive freight	22.09.2010
[4]	TAP TSI Regulation No 454/2011	Commission Regulation (EU) No 454/2011 relating to the Telematics Applications for Passenger subsystem (TAP TSI)	18.04.2021

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1 EXECUTIVE SUMMARY

Based on previous discussions and decisions taken by the TAF TSI Implementation
Reporting Group (IRG) in close cooperation with the European Union Agency for Railways (ERA), the
TAF TSI Joint Sector Group (JSG) and the Common Sector Group (CSG) adopted this **second report on
Key Performance Indicators** (KPI) related to TSI TAF an TAP operational functions.

Depending on the outcome of the current TSI TAF and TAP revision and the merging into a new
Telematic TSI, the ERA aims to replace the traditional "Degree of Implementation (DI)" reporting
based on company feedbacks with a new monitoring. The "KPI" reporting based on data coming from
TAF TAP TSI (TTT) compliant sector tools might support this new monitoring process. The KPI data
might give a better overview of the real implementation and concentrate on the usage and the
quality of the implemented functions.

The IRG was mandated to draft first ideas of specific KPI's together with stakeholders and IT-
providers. This second KPI Report contains a set of 7 different TTT functions with its related KPIs:
- Primary and Subsidiary Location Codes (PLC/SLC)
- Common Interface Implementation (CI)
- Train Running Information (TRI)
- Train Running Interruption Message (TRIM) - NEW

- Consignment Order Message (COM) - NEW
- Wagon Movement (WM) -NEW
- Rolling Stock Reference Database (RSRD)

The data in this report is provided by:
- RailNetEurope (RNE) for PLC/SLC, CI, TRI, TRIM
- Raildata for COM, WM - NEW
- International Union of Wagon Keepers (UIP) for RSRD

This second KPI Reporting was carried out in parallel with the original DI reporting.

The data collection in January 2024 proved to be very ambitious as the companies are very busy at this time of the year. All the relevant KPI data was only available by end January.

Like in all previous reports, the data published in this report by the IRG are shown as delivered by the IT provider tools. No correction is done for missing or illogical data. Any analyse or interpretation or comparison shall be done in a later stage by other entities.

2 BACKGROUND TO THE ASSIGNMENT

According to Commission Regulation (EU) No 1305/2014[1] relating to the Telematics Applications for Freight subsystem (TAF TSI) and to Commission Regulation (EU) No 454/2011[2] relating to the Telematics Applications for Passenger subsystem (TAP TSI), the European Union Agency for Railways (ERA) shall assess and oversee its implementations.

The Agency has established the 'TAF TSI Implementation Cooperation Group' and the 'TAP TSI Implementation Cooperation Group' to evaluate the reports of the sector. The remit of this group is monitoring the parameters for RU/IM communication of both TAF and TAP TSIs. Members of the European railway sector are encouraged to submit their reports through the JSG to the Agency.

Since 2013 the implementation of the TAF and TAP TSI (TTT) functions in the Rail sector were reported against the TAF and TAP TSI Masterplans as published on the ERA website. The target implementation dates for all TTT functions expired by end of 2021 – making the current TTT Implementation Reporting (DI reporting) outdated.

ERA therefore suggested establishing a TTT Deployment Reporting. Key Performance Indicators (KPIs) should give a better overview of the real deployment and concentrate on the usage and quality of the TTT functions.

The IRG developed first ideas of specific KPI's, taking into consideration the main objectives of the rail sector:

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[1] Consolidated text: Commission Regulation (EU) No 1305/2014 of 11 December 2014 on the technical specification for interoperability relating to the telematics applications for freight subsystem of the rail system in the European Union and repealing the Regulation (EC) No 62/2006, published 18th April 2021
[2] Consolidated text: 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 transEuropean rail system, published 16th June 2019

- include KPIs to indicate the quality of the data
- show the actual use of TAF TAP functions
- use automatic data coming directly from IT-Tools
- create a benefit for companies
- not create double work and check existing KPIs
- keep TAP Retail and TAF/TAP RU-IM reports separate

The data is provided by IT-Suppliers operating TTT compliant service tools for the Rail sector. The IRG drafts an annual report with this information and hands it over to ERA.

The aim is to gradually replace the Implementation Reporting (DI) by the Deployment Reporting (KPI). Because of major differences between TAP Retail and TAF/TAP RU-IM Communication in terms of reporting, the present report focuses on TTT RU-IM functions only. It is not intended to replace or conflict with any other quality report from the Rail sector, such as PRIME KPI.

The separate TTT KPI Reporting Handbook is a general guideline for NCP's, NAE's, sector organizations, implementers, and data providers.

The organization and administration of the new KPI Reporting are integral part of the JSG governance and processes. It has been adopted by the JSG and ICG. The IRG leads the process and exchanges information regularly with all involved stakeholders. Roles and responsibilities of the IRG are set out in the Telematics Governance Terms of Reference (JSG Governance Document) in force.

3 COMMON REFERENCE FILES – LOCATION CODES

3.1 Introduction

Section 4.2.10.1 of the TAF TSI[2] sets out the following mandatory requirements related to Coding of Locations, namely Primary Location Codes (PLC) and Subsidiary Location Codes (SLC).

> 4.2.10.1. R e f e r e n c e F i l e s
>
> 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 always represent the actual status. Where a reference file is in common use with the TAP TSI, the development and changes must be in line with TAP TSI, 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.

The RU/IM Telematics Sector Handbook[3] in section 9.3.3 'Location Description' further defines PLCs and SLCs.

> Definition of Primary Location
>
> Primary Location is a place used by IM to define a path for a train in TAF/TAP TSI framework/messages. This location is a rail point inside the rail network where train starts, ends, stops, or runs through or change line. This location must be managed by an Infrastructure Manager (IM) identified by company code.
>
> Primary locations are for example: stations, yards, halts, handover points, border points, open access terminals.
>
> Primary locations are identified by single and unique Primary Location codes. Primary location code is allocated based on processes defined by national entity. Primary location codes are used in any kind of TAF/TAP communication.
>
> Definition of Subsidiary Location
>
> Subsidiary location must be linked to a Primary Location and specifies in more detailed way part, attributes, or usage of Primary location. It may be also a non-rail point or a rail point that is not managed by an Infrastructure Manager (IM). It may be defined by entity having company code according to their needs. The Subsidiary location is optional and dependent upon business needs.

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[2] Consolidated text: Commission Regulation (EU) No 1305/2014 of 11 December 2014 on the technical specification for interoperability relating to the telematics applications for freight subsystem of the rail system in the European Union and repealing the Regulation (EC) No 62/2006, published 18th April 2021

[3] Sector Handbook for the Communication between Railway Undertakings and Infrastructure Managers (RU/IM Telematics Sector Handbook), submitted on 21st October 2021

The Central Reference File Database (CRD) is the European Reference Database for locations used for RU/IM communication and therefore serves as the source for input data of the respective KPIs.

IMs deliver the PLCs to CRD, and RUs provide SLCs to CRD. PLCs and SLCs are allocated by NAEs. The correctness of allocation or properties of PLCs/SLCs or is not subject of reporting.

3.2 Primary location data maintenance

Regular maintenance of PLCs in CRD is important and mandated by legislation.

IMs are regarded to maintain their PLCs in CRD when updating them at least once a year. An update means either adding a new PLC or updating/deleting an existing PLC.

KPI Definition				
The number of IMs maintaining PLCs in the CRD in relation to the total number of IMs having PLCs in the CRD indicates the level of maintenance.				
$$\frac{number\ of\ IMs\ maintaining\ PLCs}{number\ of\ IMs\ having\ PLCs} \times 100 \leq 100\ \%$$				
2023	**Q1**	**Q2**	**Q3**	**Q4**
Number of PLCs changed	1.271	688	2.435	3.335
Total number of PLCs in CRD	60.256	60.786	60.806	60.935
Changing ratio [% of PLCs]	**2**	**1**	**4**	**5**
Number of IMs maintaining PLCs	17	12	13	15
Number of IMs having PLCs	50	50	50	48
Maintenance ratio [% of IMs]	**34**	**24**	**26**	**31**

Table 1: Primary location data maintenance changing ratio

Compared to the figures of the year 2022, the following conclusions can be drawn:
- The total number of PLCs in CRD has increased on average by one thousand.
- The changing ratio of PLCs has increased from below 1 % to up to 5 %.
- The maintenance ratio of IMs in the previous year has never exceeded 30 %.

For countries with data from more than one IM, PLCs are regarded to be maintained, if the dominating IM did.
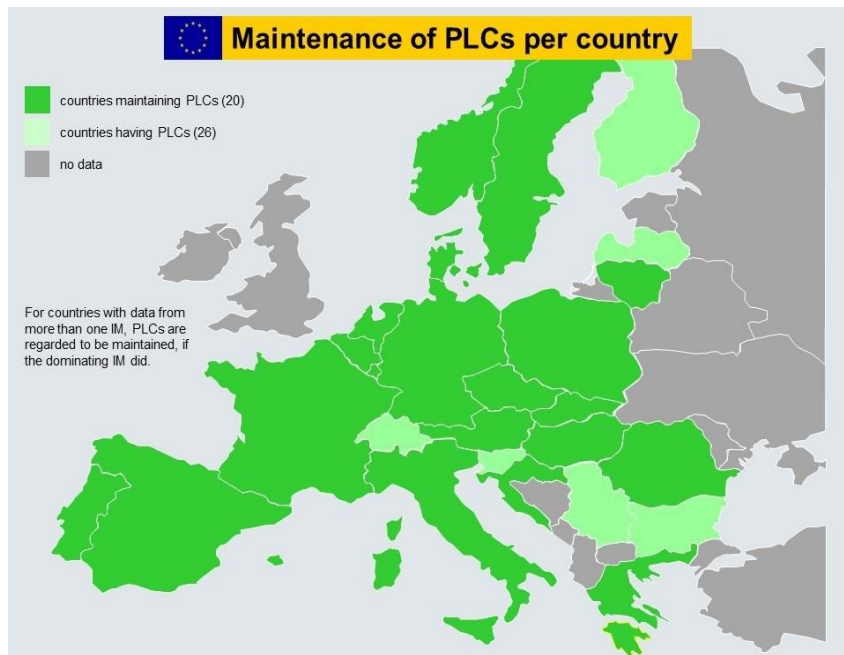

Diagram 1: Maintenance of PLCs per country

3.3 Primary location data completeness

PLCs are classified by important, voluntary properties (flags), such as GPS location data (geo coordinates) or possible commercial activity (freight and/or passenger station).

KPI Definition

This KPI is defined as the degree of recording of voluntary properties of PLCs.

$$\frac{number\ of\ PLCs\ having\ particular\ property}{total\ number\ of\ PLCs\ in\ CRD} \times 100 \le 100\ \%$$

Definition of properties to be reported:
- GPS location data (longitude and latitude) o Longitude of point representing Position of Location. It is strongly recommended to populate this element. It is possible to use up to 6 decimals. o Latitude of point representing Position of Location. It is strongly recommended to populate this element. It is possible to use up to 6 decimals.
- Freight possible (Freight start date, Freight end date) and/or Passenger possible (Passenger start date, Passenger end date) o Information, that Freight and/or
    Passenger train can make freight and/or passenger commercial activity at primary location.
    - o Start date of use Location for Freight and/or Passenger train. StartDate is mandatory if Freight and/or Passenger possible is selected.
    - o End date of use Location for Freight and/or Passenger train.

2023	Q1	Q2	Q3	Q4
PLCs with GPS location data	51.669	51.521	51.501	51.620
PLCs with commercial activity	35.495	35.554	35.498	35.559
Total number of PLCs in CRD	60.256	60.789	60.806	60.935
GPS location data ratio [% of PLCs]	**86 %**	**85 %**	**85 %**	**85 %**
Commercial activity ratio [% of PLCs]	**59 %**	**58 %**	**58 %**	**58 %**

Table 2: Primary location data completeness

For countries with data from more than one IM, completeness however calculates always like the dominating IM.

The completeness of PLCs regarding voluntary properties as displayed in the following European maps reflects the latest data of Q4 2022.

Completeness of PLCs regarding GPS location data

> 90% complete
89% - 80% complete
79% - 70% complete
< 69% complete
no data
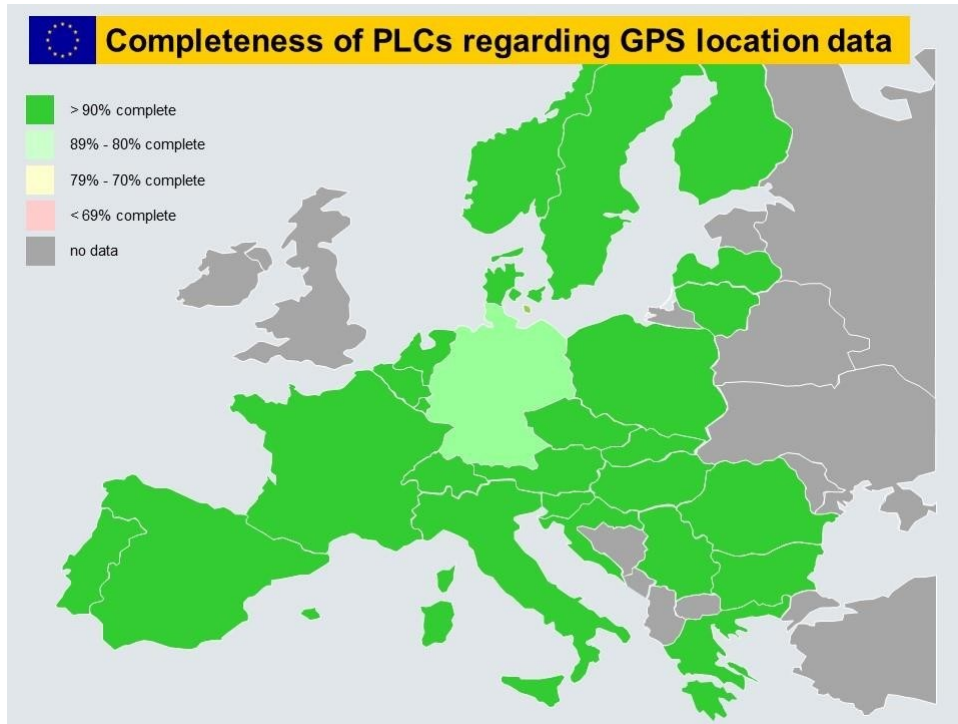
Diagram 2: Completeness of PLCs regarding GPS location data

Completeness of PLCs regarding commercial activity

> 90% complete
89% - 80% complete
79% - 70% complete
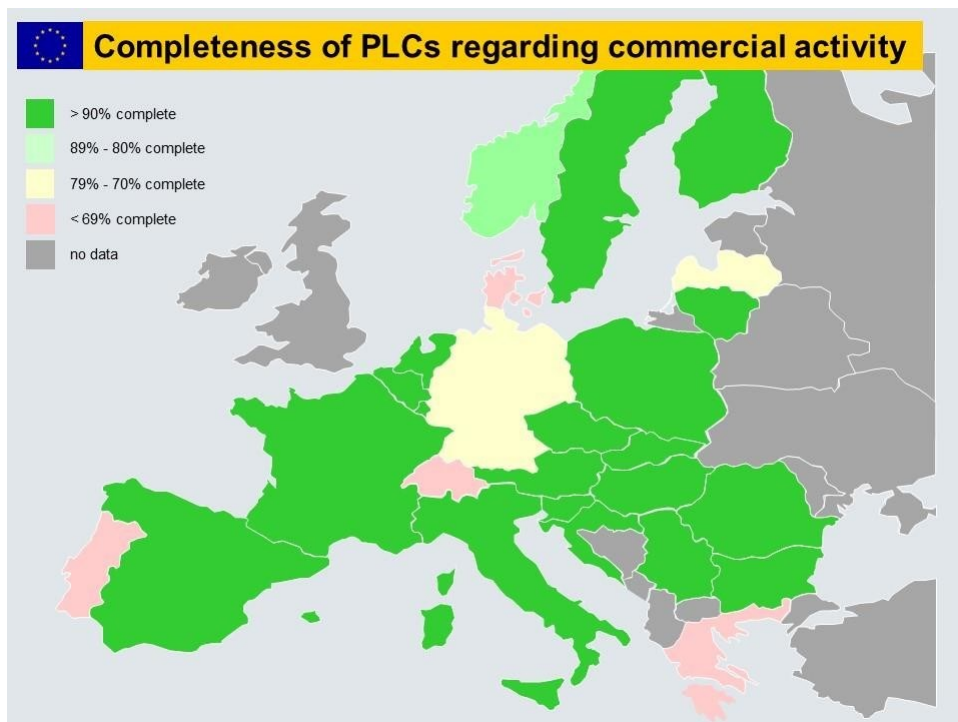< 69% complete
no data

Diagram 3: Completeness of PLCs regarding commercial activity

3.4 Number of SLCs provided in CRD

KPI Definition
This KPI provides the number of specific types of SLCs stored in CRD showing their development over time. SLCs are defined by type codes.
Absolute number per SLC Type Code

The total number of SLCs stored in CRD at the end of 2022 was 56.626 for 21 different types. At the end of 2023 this total number was with 55.114 slightly lower.

The following SLC Type Codes as defined in the TAF/TAP-xsd are selected for this KPI:

- Location Subsidiary Type Code 1 – Track
- Location Subsidiary Type Code 3 – Border point
- Location Subsidiary Type Code 15 – Platform
- Location Subsidiary Type Code 36 – Freight Yard
- Location Subsidiary Type Code 37 - Loading point
- Location Subsidiary Type Code 42 - DIUM stations
- Location Subsidiary Type Code 57 - Intermodal Terminal
- Location Subsidiary Type Code 66 - Location ENEE Code

SLC Type Code	Description	# SLC Q1/2023	# SLC Q2/2023	# SLC Q3/2023	# SLC Q4/2023
1	Track	19.042	19.037	19.042	19.091
3	Border point	238	240	240	246
15	Platform	600	600	600	600
36	Freight yard	1.432	1.432	1.433	1.433
37	Loading point	11.536	11.946	11.951	10.380
42	DIUM station	5.772	5.359	5.360	5.943
57	Intermodal terminal	86	86	565	565
66	Location ENEE code	2.687	2.687	2.687	2.683
Total		**41.393**	**41.387**	**41.878**	**40.941**

Table 3: Number of Subsidiary Location Codes per type

In general, there are only little changes between the 3-month periods. However, certain variations can be observed for the freight relevant type codes 37, 42 and 57 throughout the year 2023.

SLCs per type code in 2023

■ Q1 ■ Q2 ■ Q3 ■ Q4
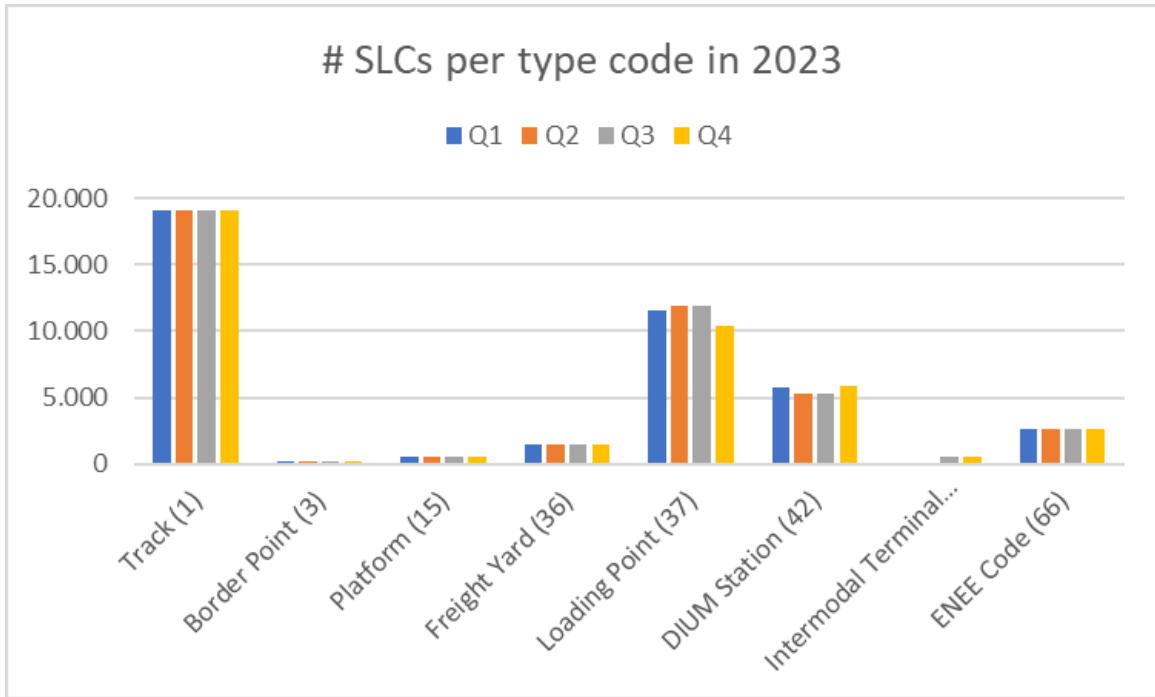
Diagram 4: Number of SLCs per type code

4 COMMON INTERFACE (CI)

KPI Definition

This KPI displays the development in terms of number of certificates provided by RNE, operating as the Single Certification Authority. RNE is the only certificate provider for TAF/TAP compliant actors.

Absolute number of certificates

Q1 2022 – 266 certificates
Q2 2022 – 185 certificates
Q3 2022 – 266 certificates
Q4 2022 – 247 certificates
Q1 2023 – 272 certificates
Q2 2023 – 353 certificates
Q3 2023 – 357 certificates
Q4 2023 – 417 certificates
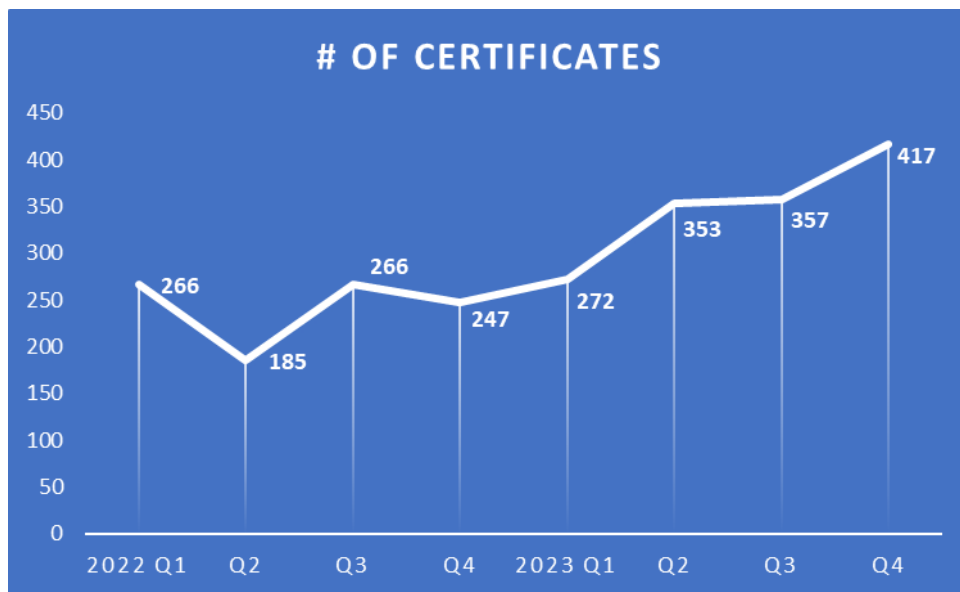
Diagram 5: Evolution of number of CI certificates

The number of certificates varies because certificates automatically expire at a specific date and will have to be provided again.

A clear upward trend is visible in 2023. The highest absolute number of certificates in 2023 is nearly 60 % above the respective number in 2022.

5 TRAIN RUNNING INFORMATION (TRI)

5.1 Introduction

Section 4.2.4.3 of the TAF TSI sets out the following mandatory requirements related to Train Running Information (TRI).

4.2.4.3. 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).

The RU/IM Telematics Sector Handbook in section 15.1 'Process triggering the Train Running Information message' further defines the TRI.

The IM has to provide train reporting at appropriate reporting points indicating actual time and the delta-time value (as described in OPE TSI § 4.2.3.4.2.1). This message is sent to the ResponsibleRU to inform RU controllers.

…

The time limit to send the message after the train has reached the reporting point is defined by national rules or contractual agreement. In practice, the sending is done in "real time" in case of electronic tracking and tracing systems.

The data collection focusses on international trains to demonstrate interoperability. According to an agreement between RNE and IMs, TRI messages for all international trains are being communicated with standardized messages in different versions to TIS. Additional bilateral exchanges between IMs sometimes exist. International trains are flagged as international touching a border station (more than one IM is involved).

5.2 Degree of usage of Train Running Information (TRI) messages

KPI Definition

This KPI indicates the degree of TRI messages provided by IMs. For this purpose, the number of TRI messages sent from TIS (TRI from TIS) is related to the number of locations, where a TIS message is expected to be sent. (Path Details).

$$\frac{number\ of\ TRI\ messages}{number\ of\ expected\ TRI\ messages} \times 100 \le 100\ \%$$

This KPI demonstrates message exchange between IMs and the TIS system of RNE. Bilateral communication between IMs is not reflected by these figures.

For the input data to the calculation the following conditions apply:

Number of TRI messages (running advice from TIS)

- Predefined locations for which IMs cannot provide TRI messages will be excluded from the reporting.

Number of expected TRI messages (path details are provided by IMs on daily basis to TIS)

- For Path Details where no single TRI running advice is available, the train will not be considered.
- Results where path details are not available (e.g., in case of re-routing) are not considered.

The KPI calculation only considers TAF compliant messages, which 13 countries are providing in 2023. Compared to the previous year 3 more countries exchange TAF compliant messages with TIS as stated in tables 6 and 7. The total number of TAF/TAP compliant messages exchanged for international freight trains has grown by more than 20 % and for international passenger trains even by more than 40 % from the year 2022 to 2023.

According to the path details provided per country, TIS expected nearly 43 million TRI messages for international freight and passenger trains in 2023. More than 38 million TRI messages (running advice) have been sent. The overall average degree of TRI messages for international trains calculates to 88 %. Quarterly values are given in the tables below.

International Freight Trains 2023	Q1	Q2	Q3	Q4	Total (2023)	Total (2022)
Timetable information (PD)	4.249.736	4.568.112	4.760.422	4.989.045	18.567.315	15.403.492
Running information (TRI)	3.899.129	4.044.907	4.003.893	3.925.806	15.873.735	12.666.557
Degree of usage TRI [%]	92	89	84	79	**85**	**82**

Table 4: Degree of usage of TRI messages for international freight trains

International Passenger Trains 2023	Q1	Q2	Q3	Q4	Total (2023)	Total (2022)
Timetable information (PD)	5.745.391	5.834.216	6.495.969	6.508.647	24.584.223	16.782.145
Running information (TRI)	5.373.410	5.235.866	5.653.006	5.549.004	21.811.286	15.247.667
Degree of usage TRI [%]	94	90	87	85	89	**91**

Table 5: Degree of usage of TRI messages for international passenger trains

Country	Number of PD messages (Freight trains)	Number of TRI messages (Freight trains)	Degree of usage [%]	[%] 2022
BE	2.822.744	2.746.957	97	78
BG	36.369	29.633	81	94
CH	3.348.671	2.813.229	84	
CZ	2.648.647	2.630.633	99	96
ES	293.464	141.935	48	60

HU	2.120.117	1.577.149	74	75
IT	2.043.299	1.722.268	84	92
NL	1.782.274	1.732.377	97	90
NO	234.393	127.118	54	
PL	1.006.019	523.289	52	
PT	182.741	156.221	85	90
SE	1.014.610	718.936	71	86
SK	1.033.967	953.990	92	62
Total	18.567.315	15.873.735	85	82

Table 6: Degree of usage of TRI messages for international freight trains per country

Country	Number of PD messages (Passenger trains)	Number of TRI messages (Passenger trains)	Degree of usage [%]	[%] 2022
BE	4.035.072	3.994.992	99	99
BG	5.711	5.349	94	98
CH	5.705.919	5.459.794	96	
CZ	4.060.893	4.026.225	99	99
ES	256.095	156.315	61	85
HU	2.698.518	1.826.475	68	72
IT	1.442.056	1.370.306	95	97
NL	1.841.820	1.809.166	98	98
NO	88.109	70.163	80	
PL	2.321.514	1.128.080	49	
PT	77.963	69.213	89	98
SE	1.146.951	1.076.812	94	96
SK	903.602	818.396	91	57
Total	24.584.223	21.811.286	89	91

Table 6: Degree of usage of TRI messages for international passenger trains per country

6 TRAIN RUNNING INTERRUPTION MESSAGE (TRIM)

6.1 Introduction

Section 4.2.5.2 of the TAF TSI sets out the following mandatory requirements related to Train Running Interruption Message (TRIM).

4.2.5.2. 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 RU/IM Telematics Sector Handbook in section 15.1 'Process triggering the Train Running Information message' further defines the TRI.

If the train has been stopped due to a disruption (e.g. line blocked, loco breakdown) and no forecast of its further run is yet available, the Train Running Interrupted messages must be sent from IM to ResponsibleRU. The message is the trigger to inform the ResponsibleRU (and the next IM if relevant). In the case of combined transport under contractual agreement, the LeadRU/ResponsibleRU shall ensure the Train Running Interruption message is provided to the Terminal Operator.

A train could not yet has reached the disruption but is likely to be affected (i.e. forecasts for locations after the disruption point are not possible). In this case, a warning can optionally be issued from the IM to the ResponsibleRU using the Train Running Interruption message with an indication in the TrainNotAtInterruptionPoint element.

…

When the disruption is on the RU-side (e.g. loco breakdown) it has to inform the IM according to § 4.2.3.3.2 of OPE TSI. The ResponsibleRU could use the Train Running Interruption message if this agreed.

After the problem is analysed, ResponsibleRU and IM decide on a way of action (e.g. rerouting, cancellation, delaying the train).

The data collection focusses on international trains to demonstrate interoperability. According to an agreement between RNE and IMs, TRIM messages for all international trains are being communicated with standardized messages in different versions to TIS. Additional bilateral exchanges between IMs sometimes exist. International trains are flagged as international touching a border station (more than one IM is involved).

6.2 Number of TRIM per country

KPI Definition
This KPI displays the development in terms of number of TRIM per country as provided by the TIS of RNE. Absolute number of TRIM per country

The KPI calculation considers TAF compliant messages only, which 7 countries were providing in 2023.

According to the TRIM provided per country, TIS processed about 75 thousand messages for international freight and passenger trains in 2023. Passenger trains only account for around 10 percent of those messages.

Country	Number of TRIM messages (Freight trains)	Number of TRIM messages (Passenger trains)
AT	3.270	1.002
BE	33.502	3.546
CZ	12.420	943
ES	2.028	511
HU	4.931	1.818
NL	12.264	506
PT	44	10
Total	68.459	8.336

Table 7: Number of TRIM for freight and passenger trains

7 CONSIGNMENT ORDER MESSAGE (COM)

7.1 Introduction

Section 4.2.1.2 of the TAF TSI sets out the following mandatory requirements related to Consignment Order Messages (COM).

4.2.1.2. Consignment orders

The consignment order is primarily a subset of the Consignment Note information. It must be forwarded to the RUs involved in the transport chain by the LRUs. The content of the Consignment order must show the relevant information which is needed for an RU to effect transportation during its responsibility until handover to next RU.

The RU/RU Telematics Sector Handbook[4] for the communication between Railway Undertakings in section 2.3.1 'Consignment Order Message - regulatory requirements' further defines the COM.

> The LRU determines the other RUs involved in the respective transportation to provide them in advance with Consignment Order Messages ("COM").
>
> …
>
> Depending on the RUs involved, several modes of data exchange can be used for one transport.
>
> Where applicable the LRU creates an internal order for its own production system.
>
> A trip plan must be created when at least one other RU is involved. This action is not part of the COM chapter.
>
> The RUs that have received a COM in advance from the LRU check their availability of resources and paths. In case of non-feasibility, the RU concerned informs the LRU in an appropriate way.

The data collection focusses on COM messages processed by the application "OpenRailFreightEdiUserSystem (ORFEUS)" managed by Raildata and already used by the sector as standard.

7.2 Degree of TAF compliant Consignment Order Messages (COM)

> KPI Definition
>
> This KPI displays the development in terms of number of COM per month as provided by the ORFEUS of Raildata.
>
> Absolute number of COM per month
>
> The number of TAF compliant messages in relation to the total number of COM indicates the respective ratio.
>
> Ratio of TAF compliant COM per month

Input data is collected at a monthly basis. Messages need to be TAF compliant including TAF locations (at least version 1.5). Older message types (smaller than 1.5) are not TAF compliant.

The total number of COM processed by ORFEUS in 2023 sums up to 809.065 messages. Overall, 58 % of these messages were TAF compliant in the year 2023.

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[4] TAF TSI Sector Handbook for the communication between Railway Undertakings (RU/RU Telematics Sector Handbook), submitted on 25 October 2023

Ratio of TAF compliant COM per month

Legend: COM | TAF compliant COM | Ratio [% TAF compliant]

Month 1: COM 30892, TAF compliant COM 39095, Ratio 56
Month 2: COM 31811, TAF compliant COM 38216, Ratio 55
Month 3: COM 33484, TAF compliant COM 43647, Ratio 57
Month 4: COM 29138, TAF compliant COM 37193, Ratio 56
Month 5: COM 30741, TAF compliant COM 41951, Ratio 58
Month 6: COM 30651, TAF compliant COM 42289, Ratio 58
Month 7: COM 26995, TAF compliant COM 36673, Ratio 58
Month 8: COM 24188, TAF compliant COM 37825, Ratio 61
Month 9: COM 28191, TAF compliant COM 39303, Ratio 58
Month 10: COM 26766, TAF compliant COM 40683, Ratio 60
Month 11: COM 23833, TAF compliant COM 42730, Ratio 64
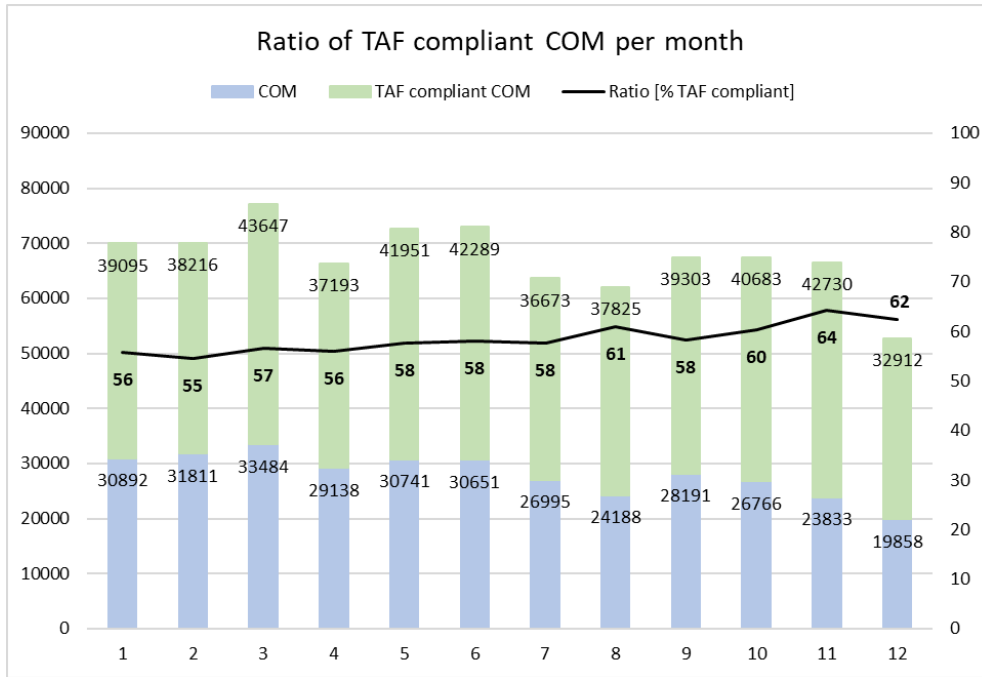Month 12: COM 19858, TAF compliant COM 32912, Ratio 62

Diagram 6: Ratio of TAF compliant COM per month

8 WAGON MOVEMENT (WM)

8.1 Introduction

Section 4.2.7 of the TAF TSI sets out the following mandatory requirements related to Wagon Movement (WM).

4.2.7. Wagon Movement

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.

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

The RU/RU Telematics Sector Handbook[5] for the communication between Railway Undertakings in section 2.3.1 'Consignment Order Message - regulatory requirements' further defines the COM.

In order to fulfil the needs of its customers and relevant wagon keepers, each RU needs to have continuously information about actual position and status of wagons which they took over for transport or other purpose.

In case when wagons are transported in collaboration between more RUs, they need to mutually exchange information about actual position and status of the wagons.

This exchange has to be performed with the Wagon Status messages.

…

RUs can exchange the Wagon Status messages either in bilateral way or through a central message broker.

The data collection focusses on WM messages processed by the application "OpenRailFreightEdiUserSystem (ISR)" managed by Raildata and already used by the sector as standard.

For the present KPI report the following Wagon Status messages have been selected:
- Wagon departure
- Wagon arrival
- Wagon delivered

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[5] TAF TSI Sector Handbook for the communication between Railway Undertakings (RU/RU Telematics Sector Handbook), submitted on 25 October 2023

8.2 Degree of TAF compliant Wagon Departure messages

One RU informs with this message other involved RU(s) that the wagon has departed from station with a train.

KPI Definition

This KPI displays the development in terms of number of Wagon Departure messages per month as provided by the ISR of Raildata.

Absolute number of WM departure per month

The number of TAF compliant messages in relation to the total number of Wagon Departure messages indicates the respective ratio.

Ratio of TAF compliant WM departure per month

Input data is collected at a monthly basis. Messages need to be TAF compliant including TAF locations (at least WSM 60). Older message types (older than WSM 60) are not TAF compliant.

The total number of Wagon Departure messages processed by ISR in 2023 sums up to more than 31 million messages. Overall, approximately 2 % of these messages were TAF compliant in the year 2023.
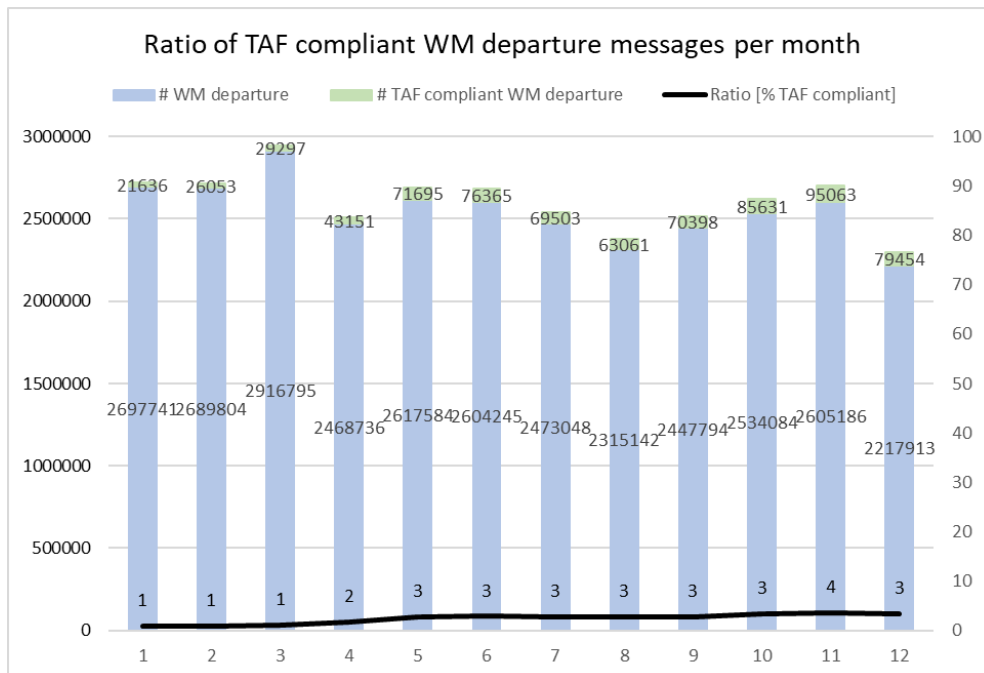

Diagram 7: Ratio of TAF compliant WM departure messages per month

8.3 Degree of TAF compliant Wagon Arrival messages

One RU informs with this message other involved RU(s) that the wagon has arrived to station with a train.

KPI Definition

This KPI displays the development in terms of number of Wagon Arrival messages per month as provided by the ISR of Raildata.

Absolute number of WM arrival per month

The number of TAF compliant messages in relation to the total number of Wagon Arrival messages indicates the respective ratio.

Ratio of TAF compliant WM arrival per month

Input data is collected at a monthly basis. Messages need to be TAF compliant including TAF locations (at least WSM 60). Older message types (older than WSM 60) are not TAF compliant.

The total number of Wagon Arrival messages processed by ISR in 2023 sums up to more than 31 million messages. Overall, approximately 3 % of these messages were TAF compliant in the year 2023.
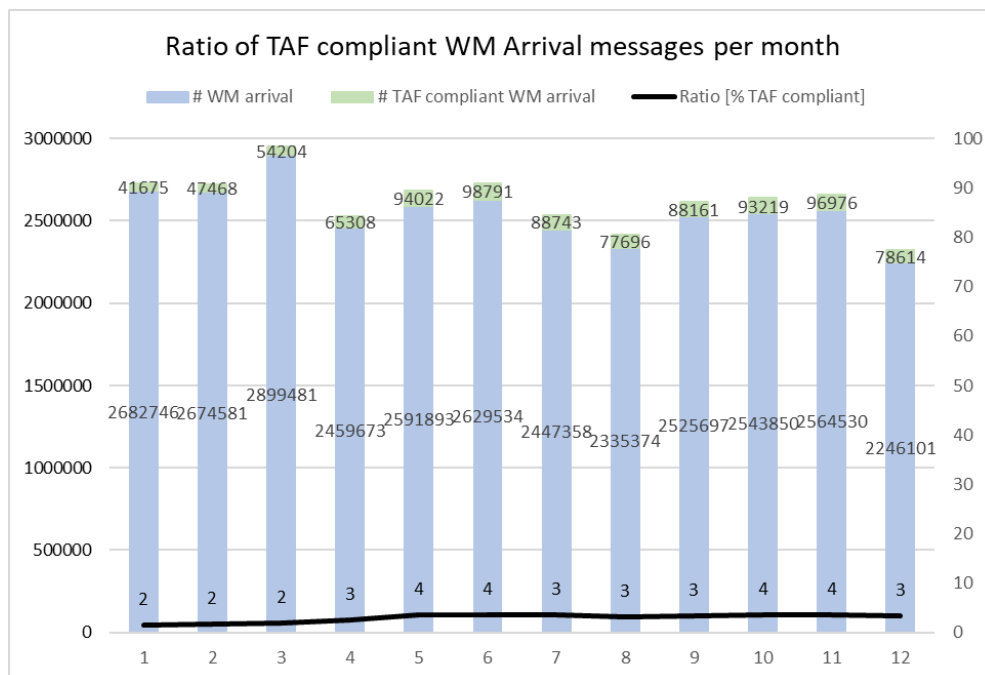

Diagram 8: Ratio of TAF compliant WM Arrival messages per month

8.4 Degree of TAF compliant Wagon Reached Destination messages

The last RU informs other involved RU(s) that the wagon arrived to destination station with a train.

KPI Definition
This KPI displays the development in terms of number of Wagon Reached Destination messages per month as provided by the ISR of Raildata.
Absolute number of WM ReachedDestination per month
The number of TAF compliant messages in relation to the total number of Wagon Reached Destination messages indicates the respective ratio.
Ratio of TAF compliant WM ReachedDestination per month

Input data is collected at a monthly basis. Messages need to be TAF compliant including TAF locations (at least WSM 60). Older message types (older than WSM 60) are not TAF compliant.

The total number of Wagon Arrival messages processed by ISR in 2023 sums up to more than 9 million messages. Overall, approximately 15 % of these messages were TAF compliant in the year 2023.
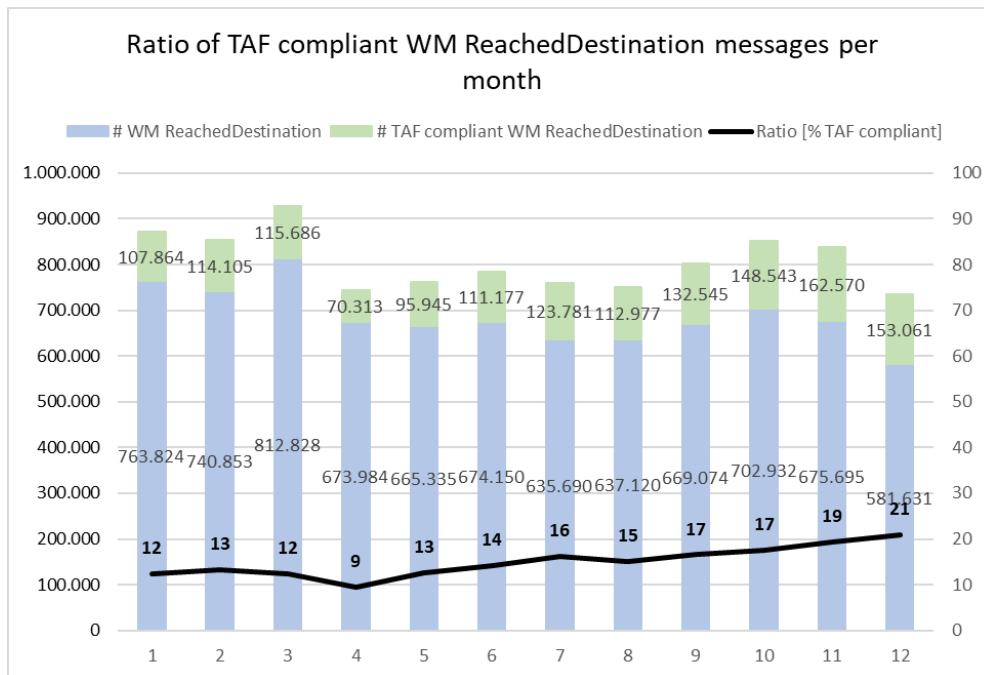

Diagram 9: Ratio of TAF compliant WM ReachedDestination messages per month

9 ROLLING STOCK REFERENCE DATABASE (RSRD)

9.1 Introduction

Section 4.2.9.2 of the TAF TSI sets out the following mandatory requirements related to Rolling Stock Reference Database (RSRD).

4.2.9.2. 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 Rolling Stock Reference Databases must allow easy access to the rolling stock reference data to minimize 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 (1), article 5, the Wagon Keepers shall store the ECM certification identification number
> - 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 RSRD function has been mirrored in appendix 16 of the GCU. All GCU Keepers (including RUs which are Keepers) have the obligation to provide RSRD data via the GCU broker. The GCU trustee provides the input data to the Implementation Reporting Group (IRG). The GCU Joint Committee (UIC, UIP, ERFA) has agreed and supports the creation of this KPI.

9.2 Use of RSRD function in GCU broker by RUs

All messages exchanged with the GCU Broker are TAF compliant. The number of RUs in the GCU broker represent the status at the end of the reporting period.

> KPI Definition
>
> This KPI shows the degree of use of RSRD function by counting the number of RUs which are querying TAF RSRD data via the GCU broker compared to all signatories RU which could potentially query RSRD data.
>
> $$\frac{number\ of\ RUs\ querying\ the\ GCU\ broker}{number\ of\ RUs\ in\ the\ GCU\ broker} \times 100 \leq 100\ \%$$

The number of different RU that query the GCU broker at least once in the respective year. The degree of use of RSRD calculates to 15% by the end of 2023 as shown in the table below.

Year	2022	2023
Number of RUs querying the GCU broker	59	79
Signatories of the GCU broker (number of RUs)	454	527
Degree of use of RSRD [% of RUs]	**13**	**15**

Table 8: Degree of usage of RSRD by RUs

9.3 Implementation of RSRD function in GCU broker by Keepers

All GCU Keepers (including RUs which are Keepers) have the obligation to provide RSRD data via the GCU broker.

KPI Definition

This KPI shows the degree of wagons registered in the GCU broker for which RSRD data are available.

$$\frac{number\ of\ wagons\ linked\ to\ RSRD}{number\ of\ wagons\ in\ the\ GCU\ broker} \times 100 \leq 100\ \%$$

The number of wagons connected to RSRD in the GCU broker by the end of 2022 is 343.118. The degree of wagons linked to RSRD in the GCU broker calculates to 62 %.

Year	2022	2023
Number of wagons connected to RSRD	331.876	343.118
Number of wagons registered in the GCU broker	553.127	553.416
Degree of wagons linked to RSRD [% of wagons]	**60**	**62**

Table 9: Degree of wagons linked to RSRD

10 CONCLUSIONS AND RECOMMENDATIONS

Even after several meetings and discussions for this second edition of the KPI reporting, the collection of the KPI data still was a challenge. The key problem remains the same: 1st to have a sound definition for a KPI equivalent to the TSI TAF TAP functions, 2nd to define the exact data the IT-tool shall deliver so it is matching the defined KPI's, 3rd to receive the data in due time.

After all, and with the thankful support from staff members of RNE, Raildata and UIP this second KPI report could be finished.

For future reports more KPI will be added, and more IT-providers will have to deliver data. For this, the data delivery must be well planned and agreed amongst all partners involved. Maybe an option could be to link the KPI data delivery with the ERA TAF TAP certification process. We recommend ERA to evaluate the possibility to sign such agreements with the TAF and TAP certified IT-providers or applicants.

For the next few years, we do not see that the KPI reporting can fully replace the old DI reporting based on company feedback with the questionnaire.

However, further development of the reporting heavily depends on the new Telematic Regulation with will likely come into force in 2025. Further steps than will be discussed with all relevant parties.

ANNEX 1: TTT COMPLIANT COMMON SECTOR TOOLS PROVIDING DATA FOR KPIS

Central Reference Data (CRD) - https://rne.eu/it/rne-applications/ccs/crd/

The CRD (formerly known as Central Repository Domain) is a centralised database provided by RailNetEurope (RNE). It stores Location Codes and Company Codes required by European regulation and makes them available to users.

Train Information System (TIS) - https://rne.eu/it/rne-applications/tis/what-is-tis/

The Train Information System (TIS) is a web-based application that supports international train management by delivering real-time train data concerning international (partly national) passenger and freight trains. The relevant data is obtained directly from the Infrastructure Managers' systems.

OpenRailFreightEdiUserSystem (ORFEUS) - https://www.raildata.coop/services/orfeus

ORFEUS stands for Open Railway Freight EDI User System. It is an information system developed and operated by RailData. It ensures the exchange of railway CIM consignment notes and CUV wagon notes data between the co-operating railway undertakings (RU) using a Central Data management System (CDS).

InternationalServiceReliability (ISR) - https://www.raildata.coop/services/isr

ISR aims for International Service Reliability. It is an information system developed and operated by RailData. It is a common tool of ISR railway undertakings for concentration and exchange information about movements of freight wagons in international traffic through a central platform. It makes possible to track both loaded and empty freight wagons and consignments across significant part of Europe.

GCU (General Contract of Use for wagons) Broker - https://gcubureau.org/gcu_broker/

The GCU Bureau and the Joint Committee strongly believe that efficient exchange of information can boost efficiency. With the GCU Broker, GCU presents a free, versatile, low-threshold communication platform, available for all its signatories. GCU Broker will leverage the company's operational software and automate the data exchanges between railway undertakings and wagon keepers by introducing machine-to machine exchange of information via XML.

ANNEX 2: MEMBERS OF THE IMPLEMENTATION REPORTING GROUP (IRG)

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