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## **EXPLANATORY DOCUMENT**

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Uniform Technical Prescription concerning “train composition and route compatibility checks” (UTP TCRC)

## EXPLANATORY DOCUMENT CONCERNING THE UTP TCRC

*This document is an explanatory document in relation to the application of the Uniform Technical Prescription concerning “train composition and route compatibility checks” (UTP TCRC). It does not contain any legal requirements. The purpose of this document is solely to facilitate the uniform application of the UTP TCRC. For the applicable legal requirements, see UTP TCRC.*

*This document was considered and approved by the Committee of Technical Experts at its 16<sup>th</sup> session (Bern, 11-12 June 2024).*

### 0. INTRODUCTION

This explanatory document concerns the version of the UTP TCRC of 1 January 2022.

The chapters in this explanatory document correspond to the chapters of the UTP TCRC.

The texts in sections 2.3, 3, 4 and 5 of this explanatory document are partly based on the texts of ERA’s guide for the application of the TSI OPE. This specifically pertains to point 3 and Annexes 1 (point 1.2.3), 3 and 4 (points 4.1, 4.2 and 4.3) of GUI/TSI OPE/2019 version 3.0 dated 28 June 2019, which can be found on the website of the European Union Agency for Railways ([www.era.europa.eu](http://www.era.europa.eu)).

Uniform Technical Prescriptions are adopted specifications and are therefore part of COTIF. In principle, each subsystem is subject to one UTP.

The UTP TCRC was developed with the following principles in mind:

1. COTIF does not fully standardise vehicles and allows for freedom of design, as long as the design satisfies the technical prescriptions in UTP WAG and UTP LOC & PAS.
2. The networks of the Contracting States may not be fully harmonised and lines between and within Contracting States may have different performance parameters (train length, axle loads, platform length, gauge, etc.).
3. Because of points 1 and 2, it cannot be taken for granted that all vehicles are compatible with all lines. Consequently, route compatibility checks are required.

The UTP TCRC differs from most other UTPs, as it is not based on one single European Union Technical Specification for Interoperability (TSI). Instead, it combines a number of parameters selected from three different EU legal texts, namely the Technical Specifications for Interoperability concerning operation and traffic management (OPE TSI<sup>1</sup>), the specifications for the register of infrastructure (RINF<sup>2</sup>) and the specification for the register of authorised types of vehicles (ERATV<sup>3</sup>).

The Annex to the UTP TCRC consists of an introductory explanation and relevant tables that list vehicle and infrastructure information on compatibility parameters. In the column furthest to the right, the procedure for checking the vehicle and train compatibility over the route intended for the transport operation is explained.

### 1. SCOPE AND PURPOSE

The scope of COTIF is limited to international traffic, so the APTU and ATMF UR and the UTPs are also therefore limited to international traffic. For practical reasons, Contracting States may choose to

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<sup>1</sup> Commission Implementing Regulation (EU) No 2019/773 of 16 May 2019:

- 4.2.2.5 Route compatibility and train composition
- 4.2.2.6 Train braking
- 4.2.2.7 Ensuring that the train is in running order
- Appendix D1

<sup>2</sup> Table 1 of the Annex to Commission Implementing Regulation (EU) 2019/777 of 16 May 2019.

<sup>3</sup> Commission Implementing Decision of 4 October 2011 on the European register of authorised types of railway vehicles, as amended.

align their rules and practices for international and domestic traffic. However, this is not an obligation under COTIF.

Route compatibility checks and train composition are operational activities that relate to the use of vehicles. The provisions in the UTP TCRC presume that the vehicles concerned are admitted to international traffic in accordance with the ATMF UR. In particular, all vehicles in the train that are intended to cross borders should be legally permitted to run on the networks of the Contracting States involved. This usually means that the vehicles composed in the train should comply with the relevant UTPs, or the relevant EU law, such as TSIs. Vehicles that existed prior to the UTPs may have legacy rights in accordance with Article 19 of the ATMF UR.

Any checks, assessments or tests that are required for vehicle admission, including risk assessments and safe integration checks, definition of the area of use, etc., are not in the scope of the UTP TCRC. The purpose of applying the UTP TCRC is not to validate the design or construction of a vehicle, but to compare and match its properties and characteristics with those of other vehicles in the same train and with the characteristics of the route on which the train is to be operated. Competent Authorities have no role in applying the UTP TCRC<sup>4</sup>. In an ideal (future) scenario, where all the vehicle properties and infrastructure characteristics are available in databases, the route compatibility checks could be conducted digitally without the need for further reviews.

It is worth recalling the ATMF UR definition of a train in comparison to the definition of a vehicle. Article 2 of the ATMF UR defines “Train” as *a formation provided with traction, consisting of one or more vehicles and prepared for operation*. “Vehicle” is defined as *a railway vehicle suitable to circulate on its own wheels on railway lines with or without traction; a vehicle is composed of one or more structural and functional subsystems*. It should be noted that an unattached locomotive or a trainset may meet the definition of a vehicle and, when used in operations, may also meet the definition of a train. Consequently, a train does not necessarily consist of multiple vehicles. In order for one or more vehicles to become a train, train composition and route compatibility checks are required and a licenced driver, a train number and movement authorisation, etc., would also be required.

The parameters in the UTP TCRC facilitate the harmonised implementation and correct application of the provisions of the ATMF UR, in particular Article 6 § 2 and Article 15a concerning the responsibilities of railway undertakings (RUs) when using vehicles in international traffic and concerning the responsibilities of infrastructure managers (IMs). These ATMF provisions make RUs responsible for route compatibility checks and require IMs to provide the RU with all relevant information about the route. The IM and the RU should have arrangements to exchange relevant operational information that may affect route compatibility.

The UTP TCRC covers two different, but connected, subjects:

- Train composition, which is the process in which, based on the technical file of each vehicle, the RU prepares the train for operation and ensures that all vehicles in the train and the train as a whole meet the essential requirements, and
- Route compatibility checks, in which the RU ascertains that the train is compatible with the route on which it intends to run the train. For this purpose, the RU should base its checks on route information provided by the IM and on vehicle information. The vehicle information should be provided by the keeper, as holder of the certificate of operation, or by the holder of the EU authorisation documentation, or by ERATV.

These activities precede the movement of the train.

Correct application of the UTP TCRC avoids or limits the need to check the train composition again at border crossing stations. It can also facilitate the recomposition of trains in situations where only the locomotive has to be changed at a border crossing station.

Although the main substance of the UTP TCRC is taken over from the EU law as set out in the OPE TSI, the RINF specifications and the ERATV specifications, not all matters dealt with by the OPE TSI, RINF specifications and ERATV specifications are covered. This is because some matters are not

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<sup>4</sup> In the context of supervision, Competent Authorities may check that railway undertakings correctly apply the UTP TCRC.

relevant in the scope of the APTU and ATMF UR. For example, the UTP TCRC does not deal with the actual operation of trains or safety certification and the licencing of RUs and IMs, as these subjects do not fall within the scope of the APTU and ATMF UR<sup>5</sup>. These matters therefore remain subject to the law applicable in each Contracting State, including EU law in Member States of the EU.

In accordance with the agreement on the accession of the EU to COTIF<sup>6</sup>, states that are members of the European Union or that apply EU law as the result of their agreement with the European Union will apply EU law between them, rather than the UTP TCRC. However, for traffic between states that apply EU law and Contracting States that do not apply EU law, the UTP TCRC would be the legal basis for train composition and route compatibility checks. In such cases, laws applicable in the states where the train is intended to be used may complement the requirements of the UTP TCRC.

## 2. ROUTE COMPATIBILITY

Route compatibility checks are the procedure by which the RU ascertains that a train and each vehicle in that train is compatible with the route on which the train is intended to be used. In the procedures related to route compatibility checks, the RU and the IM have separate and well-defined responsibilities. At the same time, they need to work together using a common approach.

The objective of route compatibility checks is to confirm the compatibility of a train with the infrastructure of the route on which it is planned to operate it. Route compatibility checks take place before the train movement is authorised. Compatibility between a train and infrastructure is affected by, but is not limited to, the dimensions of a vehicle and any load placed on it, the clearance between the train and the infrastructure or trains on adjacent tracks (gauging), the minimum required braking capacity of the train, the weight and length of a train and the capacity and performance limits of the infrastructure.

### 2.1 OBLIGATIONS OF THE RAILWAY UNDERTAKING

According to Article 6 § 2 and 15a § 2 of the ATMF UR, the RU has to ensure that the vehicles it uses in international traffic comply with the conditions set out in the ATMF UR and, in particular, that the vehicles concerned are legally permitted to be used on the network(s) concerned. It also has to ensure that these vehicles are used only on compatible infrastructure and that all vehicles are properly integrated in the train composition.

Parameters that have already been verified throughout the admission process need not be reassessed.

The checks should cover the elements and procedures listed in the annex to the UTP TCRC.

### 2.2 OBLIGATIONS OF THE INFRASTRUCTURE MANAGER

The IM is responsible for providing the RU with complete and accurate information on the infrastructure and the route, including changes to characteristics of the route, on the basis of the annex to the UTP TCRC.

The last sentence of point 2.2 of the UTP TCRC requires that “*For emergency situations or real time information, the infrastructure manager shall ensure immediate information is given to the railway undertaking through appropriate means of communication.*” As explained in chapter 1 of this explanatory document, the UTP TCRC does not cover the actual operation of trains. The quoted requirement of point 2.2 of the UTP TCRC should therefore be understood as an obligation to have the technical and operational means in place to fulfil the requirement.

For this purpose, the IM may issue instructions to the RU.

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<sup>5</sup> These subjects will come under the scope of the EST UR once they enter into force.

<sup>6</sup> [http://otif.org/fileadmin/user\\_upload/otif\\_verlinkte\\_files/04\\_recht/02\\_COTIF/AG\\_10-5\\_ad1\\_e.pdf](http://otif.org/fileadmin/user_upload/otif_verlinkte_files/04_recht/02_COTIF/AG_10-5_ad1_e.pdf)

## 2.3 ADDITIONAL ELEMENTS FOR ROUTE COMPATIBILITY

In addition to the general parameters listed in the annex to the UTP TCRC, the train or the route on which it is to operate may have special properties that warrant additional checks.

With regard to the transport of dangerous goods, the provisions of RID apply and must be complied with. These may for example relate to the use of specific vehicles, the use of specific routes, or special operating conditions.

With regard to quieter routes, the provisions of the UTP Noise apply. This means that some Contracting States have designated some or all international routes as quieter routes on which only freight wagons with low pass-by noise are permitted to run. In general, this means that all wagons in the train composition must be equipped with composite brake blocks or with disk brakes.

With regard to exceptional transport, special authority for movement is not internationally harmonised. The RU should contact the IM and/or competent authority for further details.

Special access conditions or prohibitions may apply to diesel and other thermal traction systems to underground stations.

## 3. TRAIN COMPOSITION

Based on the technical file of each vehicle, the RUs must ensure that all vehicles in the train and the train as a whole meet the essential requirements, such as safety, reliability, availability, health, environmental protection, technical compatibility and accessibility. RUs should also ensure that each vehicle is in a good state of maintenance and remains so for the duration (in terms of both time and distance) of the journey being undertaken.

Each RU should apply clearly established procedures for train composition. RUs subject to EU law should themselves establish their operational procedures based on their safety management system. RUs subject to the law of states that do not apply EU law may have to apply procedures laid down in national laws or regulations. In any case, the RUs should ensure that, before and during the whole train run, the train composition complies with all the safety and route requirements.

The compliance mentioned above is broken down into checks pertaining to each vehicle and checks related to the train composition. This should ensure that each parameter of relevance to the route concerned is checked. This may include, without being limited to:

- With regard to vehicles in the train:
  - Each vehicle should be in a good state of maintenance.
  - The load of freight wagons should be properly positioned and secured.
  - Vehicles should remain within their limits of use, which includes the axle load limits of wagons.
  - The axle loads should remain within the limits for the line or line category.
  - The gauge of each vehicle should be compatible with the line.
- With regard to the train composition:
  - The mass of the train and axle distribution should be checked for compatibility with the load carrying capacity of the line and features such as tunnels and bridges.
  - The length of the train has to be compatible with the block distances and relevant terminals and stations along the line.
  - The maximum operational speed of the train should be compatible with that of vehicles in the train.
  - Compatibility with train detection systems and with the energy subsystem should be ascertained.
  - The braking performance should be known and taken into account for operational planning.
  - The order of the formation and correct coupling of the vehicles.

Each time the train composition is changed, the RU should check the consequences for compatibility between the train and the route.

The detailed elements of the train composition that need to be checked for compatibility of the train with the route are set out in the annex to the UTP TCRC.

## **4. TRAIN BRAKING**

### **4.1 MINIMUM REQUIREMENTS OF THE BRAKING SYSTEM**

One of the provisions in section 4.1 specifies that in the event of a train accidentally separating into two parts, it is mandatory for both sets of detached vehicles to come to a stop automatically by engaging the brakes to their maximum braking effort. It is standard practice for train braking systems to be designed in accordance with the described behaviour. It is important to note that the requirements regarding vehicles (including their braking system) are not imposed by the UTP TCRC, as these requirements are covered by other UTPs, including the UTP LOC&PAS and the UTP WAG. In practical terms, compliance with the UTP TCRC means that RUs must ensure that the automatic braking functionality described is not compromised or impaired.

### **4.2 BRAKING PERFORMANCE AND MAXIMUM SPEED ALLOWED**

Both the IM and RU are concerned with braking performance. To ensure the safe operation of trains, the IM and RU must cooperate and share information.

The IM should give the RU accurate and complete information about the line characteristics in a clear and usable format. This has to include route-related information, including information on steep gradients and signalling distances that may affect the required braking performance and corresponding maximum speed. It should also indicate whether certain brake types, such as magnetic track brakes or eddy-current brakes, must not be used. The IM should also inform the RU of the measures that the RU should apply if a train fails to reach the necessary braking performance.

The RU should determine the braking performance and maximum speed necessary to ensure safe train operation on the intended route, including normal and degraded modes of operation.

The IM may simplify the procedure if it can provide the RU with the additional information mentioned in point 4.2(2) of the UTP TCRC. This information concerns reference trains that have been used during the design stages of infrastructure. Point 4.2(2) of the UTP TCRC lists three different reference trains (one train set with a maximum speed >200 km/h, one train set with a lower maximum speed and other trains, e.g. freight trains).

## **5. ENSURING THAT THE TRAIN IS IN RUNNING ORDER**

Before the train departs, the RU must check that all the necessary checks have been carried out and that all the requirements regarding safety and the route on which the train is operated have been met. The checks comprise the verification of all vehicles, their positioning within the train, the brakes, couplings, wheels, signals, and any other essential parts. This also includes safe loading of the train, including compliance with RID when dangerous goods are carried. If these steps are followed, the train should be able to operate safely and efficiently throughout the entire journey without any technical issues that might cause problems.

In practical terms, trained personnel of the RU or its subcontractors (keepers or ECMs, for example), who are responsible for checking the various components of the train, should ensure that such components are working as intended. Once all the necessary checks are completed and any possible issues are resolved, the train is deemed to be *in running order* and is ready to depart.

Lastly, the RU has to inform the IM of the train-specific information in point 5.2 of the UTP TCRC.

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