Supported by NB-Rail Association

RECOMMENDATION FOR USE

NB-RAIL COORDINATION GROUP

Administrative Decision according to Interoperability Directive (EU) 2016/797 art. 30.6

Co-funded by the European Union

RFU-RST-322	Issue 01 Date 07/07/2022

TITLE	
EVIDENCES FOR EN-UIC BRAKE SYSTEM	
ORIGINATOR	**SUBJECT RELATED TO**
TÜV SÜD NEDERLAND, TÜV SÜD RAIL	- TSI WAG 321/2013, AMENDED BY (EU) 2019/776 AND (EU) 2020/387; - TSI LOC&PAS 1302/2014, AMENDED BY (EU) 2019/776 AND (EU) 2020/387
AMENDMENT RECORD:	

DESCRIPTION AND BACKGROUND EXPLANATION

References:

[1] EN 14198:2016 only section 5.4 which is used as mandated reference in TSI L&P

[2] EN 14198:2016+A2:2021 as general reference

[3] ERA Assessment Scheme, 000MRA1044 V1.1 of 14.06.2017

Background:

TSI LOC&PAS clause 4.2.4.3 "Type of brake system"
This is a specific requirement within 4.2.4.
4.2.4 must be considered in its totality together with 6.2.3.5 (Conformity Assessment for Safety Requirements). Further (EU) 2018/545 requires the Applicant to identify any related safety and compliance requirements, which may result in further additional requirements.

4.2.4.3

*(1) "Units designed and assessed to be operated in **general operation** (various formations of vehicles from different origins; train formation not defined at design stage) on other track gauge systems than the 1 520 mm system shall be fitted with a **brake system with a brake pipe compatible with the UIC brake system**. To this end, the specification referenced in Appendix J-1, index 22. 'Requirements for the brake system of trains hauled by a locomotive' specifies the principles to be applied.*

*This requirement is set to ensure **technical compatibility of the brake function** between vehicles of various origins in a train.*

(2) There is no requirement on the type of brake system for units (trainsets or vehicles) assessed in fixed or predefined formation."

The above mentioned Appendix J-1, index 22, references EN 14198:2016 [1] (section 5.4 with its subsections). Section 5.4 of EN 14198:2016 describes the fundamental requirements for an "EN-UIC brake system" functionality and its components.

Note: To increase clarity and readability of this RFU, in the following the term "EN-UIC brake system" is used instead of "UIC brake system".

TSI WAG clause 4.2.4.2 "Safety Requirements"

This is a specific requirement within 4.2.4.
4.2.4 must be considered in its totality.
Further (EU) 2018/545 requires the Applicant to identify any related safety and compliance requirements, which may result in further additional requirements.

4.2.4.2

"*The braking system contributes to the safety level of the railway system. Therefore, the design of the braking system of a unit has to undergo a risk assessment in accordance with Commission Implementing Regulation (EU) No 402/2013 considering the hazard of complete loss of the brake capability of the unit. The severity level shall be deemed as catastrophic when:*

— *it affects the unit alone (combination of failures), or*

— *it affects the brake capability of more than the unit (single fault).*

*The fulfilment of the conditions of **C.9** and C.14 of Appendix C is presumed to be in conformity with this requirement."*

Note: Appendix C.9 lists the requirements for an EN-UIC brake system and its functionality and its components. C.14 is related to the thermal capacity. The relevant mandatory standards for C.9 are listed in Appendix D of TSI WAG.

Note: The set of requirements based on the clauses above is not mandatorily prescribed but will often include the following norms:

EN-UIC Brake System Component	*TSI LOC&PAS, 4.2.4.3 (→ EN 14198, 5.4)*	*TSI WAG, 4.2.4.2 (→ Appendix C.9)*
General System Definition	*EN 14198*	*EN 14198*
Distributor Valve	*EN 15355*	*EN 15355*
Isolating Device	*EN 15355*	*EN 15355*
Brake Mode Switching Device	*EN 15624*	*UIC 541-1**
End Cocks	*EN 14601*	*EN 14601*
Brake Couplings	*EN 15807*	*EN 15807*
Brake Block	*EN 16452*	*UIC 541-4**
Brake Block Holder	*EN 15329*	*UIC 542**

Slack Adjuster	*EN 16241*	*EN 16241*
Air Reservoirs	*EN 286-3 or EN 286-4*	*EN 286-3 or EN 286-4*
Relay Valve	*EN 15611*	*EN 15611, in analogy to TSI LOC&PAS*
Load-Sensing Valve	*EN 15625*	*EN 15625, in analogy to TSI LOC&PAS*
Axle-mounted Brake discs	*EN 14535-1*	*Often not applicable for freight wagons. If present, equivalent requirements to TSI LOC&PAS are expected*
Wheel-mounted Brake Discs	*EN 14535-2*	
Brake Pads	*EN 15328*	
Brake Pad Holder	*EN 16451*	
Brake Indicators	*EN 15220*	
Emergency Brake Acceleration Valve	*EN 15612*	
Drivers Brake Valve	*EN 14198, Annex E*	
Emergency Application Valve	*EN 14198, Annex F*	
Passenger Emergency Brake Handle	*EN 16334*	

** When TSI WAG was published in 2013, the standards EN 15624, EN 16452 and EN 15329 to replace the related UIC standard were not released yet. The remaining UIC leaflets might be replaced by the related EN standard within the next revisions of the TSI WAG.*

Description of the situation:

There appears to be different understanding among the supply industry and also NoBos which requirements need to be fulfilled in order to achieve “technical compatibility” with an EN-UIC brake system (TSI LOC&PAS or TSI WAG).

Detailed conformity assessment requirements and related evidence is not clearly defined in the TSIs, but has to be defined by the Applicant (refer to (EU) 2018/545 and RFU-STR-088).
Some applicants provide a range of documented evidence to demonstrate the properties of the installed EN-UIC brake system, others intend to only provide self-declarations of conformity prepared by the equipment manufacturers.

Questions:

1) What does the term “technical compatibility of the brake function” mean in the context of an “EN-UIC brake system”?
2) Considering the requirements for independence and impartiality and for conformity assessment according to the ERA Assessment Scheme [3], what kind of evidence is acceptable for a NoBo to assess the conformity of the EN-UIC brake system and its embedded components. (For instance, to demonstrate conformity with standards specified in section 5.4 of the EN 14189:2016 [1] and TSI WAG Appendix C.9)?

RFU-RST-322	Issue 01 Date 07/07/2022

RFU PROPOSAL

Answer to question 1)

"Technical compatibility" of a unit to other units equipped with an EN-UIC brake system in the context of the TSI is understood to mean that the components of the brake system of that unit are functioning correctly in combination with the other coupled units that are also equipped with an EN-UIC brake system.

According to EN 14198:2016+A2:2021 [2] section 5.3.3.1, the compatibility shall be achieved in terms of:

a) Coupling interface between the vehicles;
b) Transporting the brake command from one vehicle to the other;
c) The characteristics of the local control responding to the central command;
d) Transporting the brake energy from one vehicle to the other, if the brake energy supply is not provided on a local basis;
e) Comparable brake performance in terms of
    1. Brake force contribution and the permitted load transfer between vehicles;
    2. Brake application and release timings;
    3. The effect on the dynamic behaviour of the train (including operating isolated vehicles within the formation of the train).

This does not mean full compliance with all available documented requirements for EN-UIC-brake system components (e.g. all related UIC leaflets or EN standards).

Therefore, an "EN-UIC-brake system" shall fulfil a set of requirements that has been captured by the applicant. For more information see (EU) 2018/545 (requirements capture) in combination with RFU-STR-088.

The resulting set of requirements that the Applicant has determined for NoBo assessment is based on a combination of requirements which relate to the "EN-UIC-brake system" combined from the:

1) Requirements directly contained in the TSI text;
2) Requirements contained in mandatory documents to which a TSI provides a mandatory reference;
3) Requirements referenced within the aforementioned mandatory documents;
4) Requirements

a) contained in those harmonised standards that give presumption of conformity with the IOD essential requirements (references to these are published in the EU Official Journal)

– or –

b) equivalent Alternative Solutions to the requirements of 4a;

5) Requirements that are additional to 1-4 and have been determined by the applicant during the requirements capture process as necessary for the specific design solution used in a project.

For the NoBo conformity assessment, this means that the conformity of the subsystem rolling stock can only be confirmed if an installed EN-UIC brake system (including its components) is evidenced to be conform with the above set of requirements 1-5.

Answer to question 2)

The following evidence is acceptable:

- **UIC certificates** for brake component design types, or the **listing** of a brake component design type in the published Annex of the related UIC leaflet can be used as acceptable evidence **for the conformity with the requirements of a UIC leaflet.**
  Note: The conformity is in those cases considered to have been evaluated by UIC using the methods and processes which are foreseen in the related UIC-leaflets.
- **NoBo ISVs** based on conformity assessment of a brake component against specified requirements can be taken into account by the NoBo when evaluating a vehicle.
  Note: An ISV would be widely re-usable for any EC verification of subsystems in which the specific brake component is installed and where the related conditions and limits of use are fulfilled.
- **Inspection reports or inspection certificates (according to EN ISO/IEC 17020)** of a suitably accredited Type A Inspection Body evidencing that a brake component fulfils certain specified requirements can be taken into account by the NoBo when evaluating a vehicle.
  Note: Such evidence would also be widely reusable for any EC verification of subsystems in which the specific brake component is installed, and where the related conditions and limits of use are fulfilled.
- **NoBo's own conformity assessment within a RST subsystem conformity assessment project** based on conformity assessment of a brake component against specified requirements.
  Note: Such an assessment result would be limited to the installation of the specific brake components within that project specific subsystem.

RFU-RST-322	Issue 01 Date 07/07/2022

The following evidence is **not acceptable:**

- **UIC certificates** for brake component design types, or the **listing** of a brake component design type in the published Annex of the related UIC leaflet cannot be used as acceptable evidence **for the conformity with the requirements an EN standard** because they do not fully cover all EN requirements.
- **Self-assessment declarations by the Applicant** or a **"declaration of conformity" with an EN standard from the component manufacturer** are not acceptable because they do not provide the required level of independence and impartiality.

Further:

- Test Reports shall be created by a Testing Body accredited according to EN ISO/IEC 17025 (or where non-accredited testing has been evaluated via RFU-STR-022).
- Documented evidence (drawings, calculations, FEM, etc.) shall be provided by the manufacturer of the brake component in coordination with the Applicant.

THIS RFU WAS AGREED ON

PLENARY MEETING 065 – 23/06/2022

THIS RFU ENTERS INTO FORCE ON

07/07/2022 (DATE OF PUBLICATION)

FROM THIS DATE ON THIS RFU CAN BE APPLIED INSTEAD OF THE PREVIOUS MANDATORY VERSION.

RFU APPLICATION IS MANDATORY STARTING FROM

07/10/2022

AT THIS DATE ANY PREVIOUS VERSIONS OF THIS RFU WILL BE WITHDRAWN.

RFUS SHALL BE APPLIED BY ALL NOBOS. PLEASE REFER TO RFU-STR-702, CHAPTER 3 OF THE SECTION "DESCRIPTION AND BACKGROUND EXPLANATION", FOR THE LEGAL BASIS SUPPORTING THIS OBLIGATION.

ERA COMMENTS

PLE 065 – 23/06/2022: NO COMMENTS PROVIDED