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RECOMMENDATION FOR USE

NB-RAIL COORDINATION GROUP

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



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RFU-RST-308

Issue 01

Date 02/03/2021

TITLE

INTEROPERABILITY CONSTITUENT – "RUNNING GEAR"; STRUCTURAL DESIGN OF BOGIE FRAME

ORIGINATOR

TÜV SÜD Nederland B.V., ERC, TÜV
Rheinland Rail Certification B.V.

SUBJECT RELATED TO

TSI WAG (Regulation (EU) 321/2013),
amended by Reg. (EU) 1236/2013 and
Reg. (EU) 2015/924

AMENDMENT RECORD:

DESCRIPTION AND BACKGROUND EXPLANATION

Scope

This RFU gives information on existing QC-RST-020 together with Technical Advice ERA/ADV/2017-2.

Introduction

In the QC-RST-020 there are defined two different approaches to interpret the definitions of TSI WAG 321/2013 chapter 5.3.1 with chapter 4.2.3.6.1 (strength validation) for existing solutions of type y25 bogie frames. The TSI makes reference to the EN13749:2011, chapter 6.2. That EN standard explains the methodology for strength validation of bogie frames. It declares a 4-step-validation scheme for new design but also allows a simplified validation scheme for already approved frames with minor changes in design or with minor changes in the range of applicable parameters for operation.

In the Technical Advice ERA/ADV/2017-2 there is reference to the 4-step-validation scheme, also the simplified validation method acc. to the EN13749 standard is mentioned. In their analysis (chapter 4 of the ADV) they come to the conclusion: *"In the case of bogies certified as ICs under the Annex Y of the former TSI WAG, data from operation and maintenance could be certainly used for the validation against the requirements of the current TSI WAG and the EN 13749:2011 of a bogie frame identical or slightly modified. These data should not substitute the validation process of the EN, but they can be used to set out a simplified validation plan."*

Problem for Conformity Assessment

The wording in the Technical Advice ERA/ADV/2017-2 *"These data should not substitute the validation process of the EN, but they can be used to set out a simplified validation plan"* is interpreted in different way between different NoBos, also between different applicants. For some of them there is an understanding, that risk analysis together with in service experience or "only" a former IC-certificate for previous TSI WAG

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may substitute strength analysis and also strength testing at a very wide extend or, in extreme, at all.

How to understand definitions in the TSI, the Q+C and the ADV:

Following the analysis of the Technical Advice ERA/ADV/2017-2, validation of any bogie frame, that is declared conform to the TSI WAG 321/2013, the methodology for strength validation must follow the definitions of chapter 6.2 in the EN13749. That means, any “alternative approach” cannot replace the general request on strength validation by analysis and testing for the frame.

The wording in the Technical Advice ERA/ADV/2017-2 “*These data should not substitute the validation process of the EN, but they can be used to set out a simplified validation plan*” shall be understand in the way that “any data can be used to set out a simplified validation plan as long as those data shall not substitute the methodology of validation process based on analysis and testing.

Means, evidence of bogie frame strength must always be given by analysis and testing (see chapter 6.2 of the EN13749) – at least for a reference frame design. Further validation of design changes to that reference frame design or changes of parameters of operation may be granted by “any other evidence” within a simplified validation of a revised product as set out in the EN standard.

In service experience together with risk analysis without provision by analysis and testing cannot fully substitute strength validation acc. the methodology acc. to the chapter 6.2 of the EN13749.

It is possible to consider within the analysis the previous testing of a reference frame design.

Conclusion:

If a manufacturer cannot provide evidence for strength by analysis and not also by test (of a reference frame design) according to the methodology as defined in chapter 6.2 of the EN13749:2011, conformity to the TSI WAG cannot be granted nor confirmed by alternative provisions like experience from maintenance or like experience from operation only.

References

[R1] WAG TSI (Regulation (EU) 321/2013), amended by Regulation (EU) 1236/2013 and Regulation (EU) 2015/924 (in this document referred to as “new TSI WAG” or “currently valid TSI WAG”)

[R2] EN 13749:2011

[R3] EN 15827:2011

[R4] ERA Technical Advice ERA/ADV/2017-2

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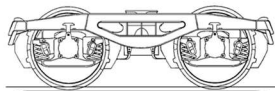
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RFU PROPOSAL

The wording in the Technical Advice ERA/ADV/2017-2 “*These data should not substitute the validation process of the EN, but they can be used to set out a simplified validation plan” shall be understood in the way that “any data can be used to set out a simplified validation plan as long as those data shall not substitute the methodology of validation process.*

Every bogie frame must be traceable back to simulation and fatigue bench test of a very similar reference bogie frame design (frame 1 in the drawing below):



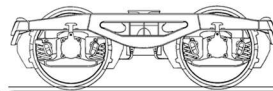
Frame 1

calculation acc.
to current EN
13749 **available**

+

static and fatigue
bench test acc.
to current EN
13749 **available**

minor
changes in
design (parameters
remain within the
range proven by
existing application)
or
same design with
minor changes in
the range of
applicable
parameters for
operation



Frame 2

required for TSI WAG
conformity, depending on
the significance of the
differences: simplified vali-
dation plan based on e.g.:

- calculation
- documented in-service
experience
- partial fatigue tests
- risk analysis

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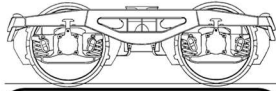


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Frame 1

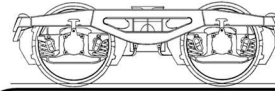
no calculation
acc. to current
EN 13749

available

or

no static and
fatigue bench
test acc. to
current EN
13749 available

minor
changes in
design (parameters
remain within the
range proven by
existing application)
or
same design with
minor changes in
the range of
applicable
parameters for
operation



Frame 2

required for TSI WAG
conformity:

- calculation acc. to current
EN 13749
- static and fatigue bench
test acc. to current EN
13749

The provisions of RFU-STR-700 apply analogously for a new production line of an existing bogie design, especially:

"The series production of the specimen, or of the ICs, and the specimen for type tests shall be manufactured according to an equivalent set of specifications, including drawings, procedures and quality plan. Any differences that could influence the outcome of the type tests shall be shown to be acceptable. In other cases, it may be required by TSIs or standards, that the capability of each production line must be demonstrated by a test of a specimen taken from that production line."

THIS RFU WAS AGREED ON

PLENARY MEETING 61

THIS RFU ENTERS INTO FORCE ON

DATE OF PUBLICATION: 02/03/2021

RFU APPLICATION IS MANDATORY STARTING FROM

02/03/2021

AT THIS DATE ANY PREVIOUS VERSIONS (OR, ALTERNATIVELY, VERSION XX) OF THIS RFU WILL BE WITHDRAWN.

ERA COMMENTS

PLENARY MEETING 61 – 25/02/2021: NO COMMENTS - OR SPECIFY IF ANY

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ERA DISCLAIMER WILL BE INCLUDED

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