



QUESTION / CLARIFICATION

CO-ORDINATION BETWEEN NOTIFIED BODIES

DIRECTIVES 96/48/EC, 2001/16/EC AND 2008/57/EC
ON THE INTEROPERABILITY OF THE TRANS-EUROPEAN
HIGH-SPEED AND CONVENTIONAL RAILWAY SYSTEMS

QC-RST-005

Issue 02

Date: 04/11/2009

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TITLE

Interoperability Constituent Pantograph, EC Verification process

ORIGINATOR

SG RST

SUBJECT RELATED TO

HIGH SPEED ROLLING STOCK TSI
2008/232/EC

DESCRIPTION AND BACKGROUND EXPLANATION

Interoperability constituents are defined as indicated in the HS RST TSI (2008/232/EC), §5.1, *interoperability constituents described in section 5.3 are constituents, whose technology, design, material, manufacturing and assessment processes are defined and enable their specification and assessment independently of the related subsystem, according to Annex IV of Directive 96/48/EC modified by Directive 2004/50/EC.*

The pantograph is defined as an interoperability constituent (see §5.3 of the RST TSI); its specification (see §5.4) is referred to §4.2.8.3.7.

The assessment of the interoperability constituent pantograph includes the requirements of HS RST TSI, §4.2.8.3.7.1 : *“Requirements on dynamic behaviour and quality of current collection shall be assessed in accordance with the High Speed Energy TSI 2006 clause 4.2.16.2.2.”*

The High Speed Energy TSI (2008/284/EC) 4.2.16.2.2 states a new design of a pantograph shall be assessed by simulation according to EN 50318:2002. This means that :

- The simulations shall be made using at least two different TSI compliant overhead contact lines for the appropriate system, at the design speed of the Pantograph;
- If the simulation results are acceptable, a site test shall be made using a representative section of one of the overhead contact lines used in the simulation;
- If all the assessments are passed successfully, the tested pantograph design shall be considered as compliant and can be used on various designs of rolling stock provided that the mean contact force on the rolling stock complies with the requirements of clause 4.2.16.1.
- When an approved interoperability constituent pantograph is to be installed on new rolling stock, testing shall be limited to the mean contact force requirements.

This point does not meet the interoperability constituent definition indicated above. The dynamic behaviour is a function of the aerodynamic and dynamic effects of the vehicle where the pantograph is mounted, as well as the dynamic characteristics of the overhead line. This means that *dynamic behaviour and quality of current collection* are characteristics that can be assessed only as part of the subsystem Rolling Stock, not as the interoperability constituent pantograph. It should also be noted that the quality of current collection also depends on the interoperability constituent contact strip (see §5.3 and §4.2.8.3.8 of the RST TSI).



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SUGGESTED RESOLUTION / INTERPRETATION

The specification of the IC Pantograph should be complete after the simulation tests on the compliant overhead contact lines, provided that the simulation tool has been validated.

The site tests on compliant overhead lines should be part of the subsystem assessment.

Consideration should be given to the extent to which tests on any given vehicle type are representative of tests on any other vehicle type taking into account, for example, the suspension and dynamic characteristics of different vehicle types and the aerodynamic performance of different designs.

ORGANISATION(S) REQUESTED TO RESPOND (E.G. TSI GROUP, RISC, ERA ETC.)

SG-ENE, RISC, ERA

DATE OF AGREEMENT AT NB RAIL PLENARY MEETING

04/02/2009 (Issue 01)

RESPONSE FROM ORGANISATION ABOVE

ERA answer dated 04/11/2009:

The pantograph is the component that ensures the current collection from the overhead contact line (OCL).

The quality of the current collection depends on characteristics of the OCL, of the pantograph and of the rolling stock; these 3 elements have a certain dynamic behaviour that has an impact on the final performance.

When a pantograph is designed, a set of characteristics regarding the OCL are taken into account, including the maximum operating speed of the rolling stock (which depends on the OCL and on the rolling stock); in addition, the design allows for the adjustment of the contact forces (static and dynamic), by different means (pressure, springs, deflector...).

A pantograph is not designed for a particular rolling stock, but for a type of OCL and a maximum speed.

The definition of the pantograph as an interoperability constituent (IC) in the HS RST TSI is in line with this principle.

Tests performed for the assessment of the pantograph as IC aim at validating characteristics of the pantograph itself, for OCLs TSI compliant and for a certain maximum speed (area of use of the IC).

The concept of IC allows the designer or manufacturer of the pantograph to get an EC certificate independently of a particular use of the pantograph.

When this pantograph is integrated in a rolling stock, the applicant for this rolling stock has to make the necessary adjustments in order to get a mean contact force in the range specified in the TSI.



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