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## OPINION

*ERA/OPI/2018-1*

OF THE EUROPEAN UNION AGENCY FOR RAILWAYS

for

THE EUROPEAN COMMISSION

regarding

Analysis of the innovative solution proposed by SNCF Réseau for  
the design of the overhead contact line in order to allow  
operational speeds up to 360 km/h

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The present document is a non-legally binding opinion of the European Union Agency for Railways. It does not represent the view of other EU institutions and bodies, and is without prejudice to the decision-making processes foreseen by the applicable EU legislation. Furthermore, a binding interpretation of EU law is the sole competence of the Court of Justice of the European Union.

## 1. General context

- 1.1. In its letter Ares(2018)886679 of 15/02/2018, the European Commission asked the Agency to provide an opinion regarding a proposal of innovative solution submitted by SNCF Réseau, related to Commission Regulation (EU) 1301/2014 on the technical specifications for interoperability relating to the 'energy' subsystem of the rail system in the Union (ENE TSI). It concerns a proposal for the design of the overhead contact line in order to allow operational speeds up to 360 km/h.
- 1.2. The Commission Regulation (EU) 1301/2014 (ENE TSI) sets out requirements as regards the design of the overhead contact line interoperability constituent up to an operational speed of 320 km/h. For speeds above 320 km/h ENE TSI provides that the procedure of innovative solution is to be applied.
- 1.3. The French infrastructure manager SNCF Réseau submitted a request for innovative solution to extend from 320 km/h to 360 km/h the use of the curve of the mean contact force set out in ENE TSI.  
  
The Commission indicates, in its above-mentioned letter, that the Italian infrastructure manager Rete Ferroviaria Italiana (RFI) also mentioned informally a similar request, but did not submit a proposal.
- 1.4. Under these circumstances, the Agency is asked by the European Commission to provide an opinion on the feasibility to use the proposed innovative solution as an acceptable means of compliance for the certification of the overhead contact line. The Agency is requested to take into account, in its assessment, the informal information received from RFI regarding its technical solution in order to have a harmonised approach.

## 2. Legal background

- 2.1. The Commission based its request on Article 10 (2) of Regulation (EU) 2016/796 of the European Parliament and of the Council of 11 May 2016 on the European Union Agency for Railways and repealing Regulation (EC) No 881/20041 (the Agency Regulation).
- 2.2. According to the provisions of Article 10 (2) of the Agency Regulation, the European Commission has the possibility to request an opinion of the Agency on amendments to any act adopted based on the Interoperability Directive.
- 2.3. The Commission Regulation (EU) No 1301/2014 of 18 November 2014 on the technical specifications for interoperability relating to the 'energy' subsystem of the rail system in the Union (ENE TSI), was adopted based on the Interoperability Directive and therefore is in scope of the provisions of Article 10 (2) of the Agency Regulation, as described above.
- 2.4. The above-mentioned Commission request concerns point 4.2.11 of the ENE TSI, providing requirements for mean contact force. These provisions are applicable for speeds up to 320 km/h. For speeds above 320 km/h, the procedure for innovative solutions, as provided for in Article 10 of the ENE TSI, must be applied.

## 3. Analysis

- 3.1. The basic parameter 4.2.11 - *Mean contact force* contains requirements concerning the *energy subsystem*. The same parameter is also referred to in the point 5.2.1.2 *Mean contact force* for the *overhead contact line (OCL)*.

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<sup>1</sup> OJ L 138, 26.5.2016, p. 1.

3.2. The requirements set out in the ENE TSI are based on the European standard EN 50367:2012, where in the clause 7.3, the table 6 includes formulas for mean contact forces ( $F_m$ ) in relation to speed for traction current supply systems. Though the table itself does not set out maximum speed limits, in the clause 7.3, before the table, there is the following statement:

“For speeds higher than 320 km/h national rules for the values of  $F_m$  shall apply.”

3.3. The maximum speed limit of 320 km/h for the requirement related to mean contact force was discussed in detail by the working party involved in the development of the TSI. The reasons behind setting this limit were the following:

- Tests with higher speeds were performed but there were no experiences in daily operation with speeds higher than 320 km/h and its effects on the maintenance of installations (e.g. a possible increase of wear of the equipment, etc.);
- At the moment of drafting the TSI there were no mature enough projects in Europe with a design speed more than 320 km/h.

However, the rapid development of high-speed networks outside Europe generated a fast expansion of new technologies and a need for a significant increase of the speed. New projects were developed (especially in vast countries, like China) that already take into account possible further progress in the future, therefore setting the maximum speed of trains at a level much beyond current limits. The manufacturers outside Europe (not being limited by legal constraints) started to offer tested, ready to use products for such speeds and secured a privileged position on the market.

3.4. Additionally, current requirements set out in INF and LOC&PAS TSIs already take into account the range of speed up to 350 km/h.

3.5. The European Commission has recently received two requests relating the extension of the curve of the mean contact force set out in ENE TSI:

- The French infrastructure manager SNCF Réseau submitted a request for an innovative solution;
- The Italian infrastructure manager Rete Ferroviaria Italiana (RFI) raised informally a similar request to extend the curve of the mean contact force to 350 km/h. Simulations and tests, performed by RFI on their network confirmed the French approach. However, RFI did not submit an official proposal until now.

3.6. SNCF Réseau has already designed an OCL for speeds up to 350 km/h called “V350”, but it is operated at 320 km/h.

SNCF Réseau also designed the OCL which permitted to reach the speed world record of 574,8 km/h and under which 2200 km test runs have been made at speeds above 400 km/h, and 720 km at speeds above 500 km/h.

3.7. SNCF Réseau owns certified software (Certificate No 1305/0059 Edition 3, issued by Certifer according to EN 50318:2002 as required by the point 6.1.4.1 of ENE TSI) which allows to simulate the interaction between the pantograph and the OCL.

3.8. The OCL type “V360” is a modified version of “V350” and is now under the process of EC verification performed by Certifer.

3.9. Together with the request, SNCF Réseau provided the results of simulations and test measurements done with the “V360” OCL type (with the application of two different types of TSI compliant pantographs), confirming the fulfilment of the requirements for mean contact force ( $F_m$ ) for speeds up to 360 km/h.

3.10. Between 19 March and 3 April 2018, the Agency carried out external consultations with representative bodies, NIBs and NSAs on the draft of this opinion and the accompanying light impact assessment. The Agency received seven replies, five of which agreed with the proposed opinion without any objections, while the other two expressed some reservations.

One reservation underlined the need of additional *‘technical exchanges between entities that carried out experiments in this speed range’* (320-260 km/h) and the other proposed to extend the limit only to 350 km/h until more data (studies and experience) become available. .

3.11. The Agency considers that the results of simulations and test measurements provided by the requester are sufficient and confirm that the requirement 4.2.11 of ENE TSI could be extended for speed up to 360 km/h for AC traction supply systems, despite the two reservations expressed above.

3.12. The Agency also takes note that there is a market demand for IC OCL for speed 360 km/h, and has initiated the procedure to start the revision of the standard EN 50367 to take into account existing technical experiences.

#### 4. The opinion

4.1. Taking into account the above arguments, the results of simulations and test measurements provided in the SNCF Réseau request, the outcomes of the external consultation and the results of the light impact assessment, the Agency proposes this innovative solution to be accepted.

4.2. Furthermore, the point 4.2.11 of ENE TSI should be modified to extend the relation between mean contact force and speed up to 360 km/h for AC traction supply systems.

4.3. The paragraph (4) of Point 4.2.11 *Mean contact force* should therefore be amended as follows:

‘(4) The curves apply to speed up to 360 km/h. For speeds above 360 km/h procedures set out in point 6.1.3 shall apply.’

Valenciennes,



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