European Railway Agency

Executive Director

ADVICE

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OF THE EUROPEAN RAILWAY AGENCY

FOR

EUROPEAN COMMISSION

REGARDING

NB RAIL-RFU-RST-079 CONCERNING CRITERIA FOR A TRAIN DEPARTING FROM A PLATFORM

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1 General Context

1. With the note referenced as "Ares(2013)2939577" and dated on 28 August 2013, the European Commission, Directorate General for Mobility and Transport, Directorate B, requested the European Railway Agency (hereafter referred to as the 'Agency' or 'ERA') for an advice concerning a Recommendation For Use (RFU) from NB-Rail concerning the criteria for a train departing from a platform used in the passenger alarm function.
2. The request was triggered by a letter referenced as "Ares(2013)2027825" sent by the Chairman of NB-Rail to the European Commission on 03 June 2013. In its letter, NB-Rail would like to bring the attention of the Commission on an issue identified by NB-Rail as safety critical, which is subject of a RFU referenced as "RFU-RST-079" issue 01 dated on 30 April 2013, approved in a plenary meeting of NB-Rail.
3. As explained in the letter and in the RFU, NB-Rail considers that the criteria for a train departing from a platform defined in the Commission Decision 2011/291/EU concerning a technical specification for interoperability relating to the rolling stock subsystem — 'Locomotives and passenger rolling stock' of the trans-European conventional rail system[1] (hereafter referred to as 'TSI CR LOC&PAS') is triggered too soon after the train departure. The criteria being used to release the possibility of a direct application of the service or emergency brake command following a passenger alarm activation, NB-Rail considers that passengers will not have sufficient time to react and directly stop the train in case of persons or objects trapped in doors.

2 Legal Background

1. In consideration of Regulation (EC) No 881/2004 of the European Parliament and of the Council of 29 April 2004 establishing a European Railway Agency[2] (Agency Regulation), Article 21b provides the European Commission with the possibility to request an advice from the Agency in matters requiring specific know-how.
2. The request for advice is relating to the clause 4.2.5.3 "Passenger alarm: functional requirements" of the TSI CR LOC&PAS, and in particular to its following extract:

> *"Criteria for a train departing from a platform:*
>
> *A train is deemed to be departing from a platform during the period of time elapsing between the moment when door status is changed from 'released' to 'closed and locked' and the moment when the last vehicle has left the platform.*
>
> *This moment shall be detected by an onboard device. If the platform is not physically detected, the train is deemed to have left the platform when:*
>
> *— the speed of the train reaches 15 (+/- 5) km/h, or:*
>
> *— the distance covered is 100 (+/- 20) m,*
>
> *whichever occurs the first."*

3. NB-Rail has issued a 'Recommendation for use' (RFU-RST-079 issue 01 dated on 30/04/2013) with the following text:

> *"The requirement TSI LOC&PAS 2011/291/EC 4.2.5.3 first indent:*
> *— the speed of the train reaches 15 (+/- 5)* ***km/h****, or*
> *is not considered to satisfy the essential requirement SAFTEY of 2008/57/EC.*
> *Instead either:*

[1] OJ L 139, 26.5.2011, p.1.
[2] OJ L 164, 30.04.2004, p. 1, as last amended by Regulation (EC) No 1335/2008 (OJ L 354, 31.12.2008, p. 51)

1) The alternative requirement
*"— the speed of the train reaches 15 (+/- 5) **m/s**, or*
shall be employed, as this is considered to satisfy the essential requirement SAFETY.
2) An alternative requirement replacing the first indent of 4.2.5.3 shall be established by the Applicant by employing a risk based approach according to CSM 352 of 2009. The NoBo shall evaluate, whether this alternative requirement complies with the essential requirement SAFETY and in case of compliance use the alternative requirement in the EC verification procedure."

3 Analysis

3.1 Technical background relating to the clause 4.2.5.3 of the TSI CR LOC&PAS

The Commission Decision 2008/232/EC[3] concerning a technical specification for interoperability relating to the 'rolling stock' sub-system of the trans-European high-speed rail system (hereafter referred to as 'TSI HS RST') specifies a passenger alarm system allowing passengers to initiate a brake in any circumstances. Additionally, the possibility to override this braking order is required for operation in tunnels in order to allow the driver to choose a relevant location for stopping the train; however, the technical implementation of this 'brake override' has led to difficulties.
Since 2006, in order to overcome these difficulties, the passenger alarm functional requirements have been redefined by experts from the railway sector; the main conclusion has been that the brake should be initiated by the driver (the passenger alarm being a means to inform him of critical situations), with only one exception when the train is in a station at or departing from a platform. The negative impact on operation and traffic management of the misuse or abusive use of passenger alarms has been taken into account in the analysis, with the objective not to impose to railway undertakings unjustified mandatory rules that would affect the efficiency of the service they provide.
During the drafting of the TSI CR LOC&PAS in 2007, this 'new' functional requirement was specified as an alternative to the requirement of the TSI HS RST, in order to allow the sector to implement the most recent findings in a smooth transition. At that time, due to the novelty, experts found necessary to include in the TSI a clear criteria for a train departing from a platform (as a 'minimum' possibility given to passengers to directly apply the brake), and it was decided to consider two combined criteria: a distance one, based on the usual length of platform, and a speed one, to take into account the case of a train leaving a platform at low speed (quite frequent in conjunction with signals) and the impact of the braking distance.
In order to make clear that the criteria given are considered as a means of compliance, the wording *"the train is deemed to have left the platform when"* is used in the corresponding clause of the TSI.
When the application guide was drafted, it was asked by participants to the working party if it is allowed to use a distance higher than the specified one (100 meters); a positive answer was given, and this is reflected in the application guide issued by ERA. The same applies for the speed, even if it is not explicitly mentioned in the application guide.

3.2 Proposal made in the recommendation from the Agency for a revised TSI LOC&PAS

The Agency established in 2010 a working party in charge of revising, merging and extending the scope of the two TSIs relating to the rolling stock subsystem: TSI HS RST TSI and TSI CR LOC&PAS.
In December 2012, the Agency issued the corresponding recommendation for a revised TSI LOC&PAS to the Commission[4].

[3] OJ L 84, 26.3.2008, p. 132
[4] ERA/REC/07-2012/INT, dated on 12 December 2012, available at http://www.era.europa.eu/Document-Register/Pages/Recommendation-on-revision-of-TSI-LOC-and-PAS.aspx

The draft Commission regulation on the revised TSI LOC&PAS which has been prepared based on the Agency's above mentioned recommendation is at final stage of discussion in the Railway Interoperability and Safety Committee before its adoption by the Commission.

This revised TSI LOC&PAS takes into account technical progress and allows only the alternative solution of the TSI CR LOC&PAS, as specified in its clause 4.2.5.3.3:

> *"(1) when the train is stopped at a platform or departing from a platform, activation of a passenger alarm shall lead to a direct application of the service brake or the emergency brake, resulting in a complete stop. In this case, only after the train has come to a complete stop, a system shall allow the driver to cancel any automatic braking action initiated by the passenger alarm;"*

The criteria for a train departing from a platform are specified in the following clause:

> *"4.2.5.3.4 CRITERIA FOR A TRAIN DEPARTING FROM A PLATFORM*
> *(1) A train is deemed to be departing from a platform during the period of time elapsing between the moment when door status is changed from 'released' to 'closed and locked' and the moment when the train has partly left the platform.*
> *(2) This moment shall be detected on-board (function allowing physical detection of the platform or based on speed or distance criteria, or any alternative criteria).*
> *(3) For units intended to operate on lines that are fitted with the ETCS track side system for control-command and signaling (including "passenger door" information as described in Annex A, Index 7 of TSI CCS), this on-board device shall be able to receive from the ETCS system the information related to platform."*

The detailed definition of the criteria is let to the Applicant, with consideration of the foreseen conditions of use of the vehicle to be specified by the user (railway undertaking). The application guide is currently under drafting process, and will take into account inputs from the CEN working group in charge of the standard prEN 16334 "Passenger alarm system"; this standard may provide technical solutions covering the functional requirement expressed in the TSI. For memory, the Agency issued a request for standard relating to this subject in 2008, and the draft standard was subject of a first enquiry beginning of 2012; a publication by CEN of the EN 16334 is foreseen in the 2nd semester of 2014.

3.3 Technical analysis of the proposal from NB-Rail

NB-Rail points out in its letter and in the RFU-RST-079 safety aspects linked to the operation of passenger doors. ERA reminds that in order to cover safety aspects, this system is subject to several mandatory requirements included in TSIs, such as warning and obstacle detection when doors are closing, door-traction interlock (see TSI CR LOC&PAS clause 4.2.5.6 point F " *Traction power shall be applied only when all doors are closed and locked,...*") and safety requirements (open point in TSI CR LOC&PAS, covered in clause 4.2.5.7.8 of the proposed revised TSI LOC&PAS).

Regarding the possible mistake on the speed criterion unit mentioned by NB-Rail (point 1/ of the RFU proposal), the Agency does not support this view, as this is not consistent with the explanations given in point 3.1 above; NB-Rail reports that having 15 m/s instead of 15 km/h would correspond to a distance of 112 meters for trains of high acceleration; it means that the distance criteria of 100 meters would always occur before the speed criteria 15 m/s, making this second criteria useless; therefore, the intention of the working party who drafted the TSI was not to specify a speed threshold of 15 m/s.
Regarding the time let to passenger to react in case they detect a problem as evaluated by NB-Rail, the Agency thinks that the complete sequence of events should be considered: warning before closing of doors, closing and locking of all doors, time to reach the speed criteria (including time to reach the maximum acceleration).

The Agency would like to remind that in any case, the driver is immediately informed when a passenger alarm is triggered, and has the possibility to initiate a brake; an operational rule may require from the driver to do so in cases to be identified by the user of the train, with consideration of its operating constraints; the location where the train will be at stop after this brake application is to be considered (still along the platform, outside of the station...) as it was by experts involved in the definition of the new

alternative requirement described in point 3.1 above (stopping a train at a non adequate location may put passengers at danger).
For comparison, it has to be noted that most of the urban railway systems are operated with an acceptable level of safety, without giving the possibility to passengers to directly apply the brake.

The presence on board of staff, or the use of cameras to visualize the doors areas (sometimes implemented on suburban trains on a voluntary basis) also contribute to the global level of safety regarding the operation of passenger doors, in addition to mandatory harmonized requirements specified in TSIs.

Regarding the method to be applied in case the Applicant proposes different criteria (point 2/ of the RFU proposal), it shall justify that the functional requirement expressed in the TSI is met (as explained in the application guide); the method to be applied for this demonstration is let to the applicant; the application of Common Safety Methods on Risk Assessment is not mandated by the TSI in such a case. The proposed revised TSI LOC&PAS specifies a functional requirement and does not include any value for a speed/distance criteria; its application guide will take into account as means of compliance relevant inputs from the EN standard (prEN 16344) under drafting process, supposed to reflect the common view of the railway sector

3.4 Formal aspect

A recommendation for use is not supposed to modify a TSI, but to recommend to Notified Bodies how to assess a TSI requirement. In the present case (RFU-RST-079), NB-Rail proposes an assessment criteria and an assessment methodology that would be relevant for a RFU if the TSI would not already include an assessment criteria. The proposal from NB-Rail remains TSI compliant (the proposed criteria would be triggered after the criteria mentioned in the TSI), but restricts the possibilities given to Applicants by the TSI; it that sense, it modifies the TSI. The decision to issue a RFU was made in order to have an immediate action, considering possible safety implications, and ERA was informed of this decision. NB-Rail expresses in the RFU that *"the speed limit of the train is given in a false unit"* (km/h instead of m/s) meaning that there would be an error in the TSI; such case should be the subject of a Question/Clarification from NB-Rail, in order for the Agency to confirm at the request of the Commission if there is an error or a deficiency in the TSI.

4 The advice

1. The Agency has not identified any error in the clause 4.2.5.3 of the TSI CR LOC&PAS.
2. Common Safety Methods on Risk Assessment are not mandated by the TSI to justify the criteria used.
3. The Agency delivers the present advice as if NB-Rail would have issued a 'Question/Clarification' instead of a 'Recommendation For Use'.
4. The Agency advises the Commission to formally ask to NB-Rail to withdraw the concerned RFU-RST-079.

Valenciennes, 20 SEP. 2013

Marcel VERSLYPE
Executive Director

ANNEX 1

letter sent by the Chairman of NB-Rail to the European Commission ("Ares(2013)2027825"; 4 pages)

NB-RAIL

Mr. Jean-Eric Paquet
Chairman RISC
Directorate B - European mobility network
European Commission
DG for Mobility and Transport
B – 1049 Bruxelles

Pleax register
CF: B2

Utrecht, 3rd June 2013

Concerns: NB-Rail – RFU-RST-079: Train departing from a platform

Dear Mr. Paquet,

as has been discussed during the last NB-Rail Plenary Meeting Nr. 38, 8th May 2013, in my role of actual chairman of NB-Rail, I would like to bring to your attention a safety critical issue regarding the Rolling Stock TSI.

The TSI-LOC&PAS (2011/291/EC) defines criteria for a train departing from a platform, which require a reaction too soon. As NB-Rail considers this issue safety critical, it has been laid down in an RFU, which has been voted on and approved during the last Plenary Meeting. The precise contents has been presented in the actual RFU-RST-079 accompanying this letter.

Meanwhile we ask the commission to have ERA elaborate on this subject by means of issuing a Technical Opinion.
We also invite you to distribute this NB-Rail letter within the Commission and also to the members of RISC for further discussion. Please do not hesitate to contact us if you have any questions.

Respectfully yours,

Paul H.J. van de Ven, MIRSE
Certification Manager Railcert B.V.
Chairman NB-Rail 2012-2013

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TITLE	
CRITERIA FOR A TRAIN DEPARTING FROM A PLATFORM	
ORIGINATOR	**SUBJECT RELATED TO**
EBC	TSI LOC PAS (2011/291/EU)

DESCRIPTION AND BACKGROUND EXPLANATION

Introduction

Despite installation of detection systems, dangerous incidents relating to passengers or objects becoming trapped upon door closure are still a relevant risk at railway operation. A number of recent and current legal cases which relate to incidents of this nature are underlining this.

The associated Risk Severity for the Hazard of trapping passengers in doors and subsequent departure from a platform is typically considered to be falling into a category of

-severe life threatening injuries up to a single casualty

due to the potential of trapped passengers being dragged along and forced to collide with obstacles or indeed trapped objects becoming dislodged and projected at significant momentum towards persons.

As a less indirectly safety related side effect: Passengers becoming accidentally separated from minor infants or from their pets with the lead trapped in the door are usually considered by RUs to also avail of this function.

With driver-only operations the mitigation of a guard supervising the closure of doors and confirming that no passenger/ object is trapped is increasingly becoming obsolete.

As part of the mitigation strategy against the mentioned core risk, it was always considered, that other passengers would upon taking notice of the incident use the nearest passenger emergency brake device to keep the train from departing - or if the train is already accelerating – to stop it as fast as possible at or near the platform.

In recent years trains have increasingly become fitted with emergency override systems to prevent them from being stopped by passengers inside long tunnels (or other unsuitable locations) where mass evacuation or treatment of fire on board could not be effectively performed. With this system activated, a passenger emergency brake request could be deferred by up to 15min.

From the above it becomes clear, that the Instant need for stopping a train after a door related incident and the need for emergency brake override are two concurrent safety requirements which require a clearly defined status transition upon departure of a train from a platform. The first function must be active in the **Platform Zone**, the second when traveling on the **Open Line**.

It is considered by NB-Rail, that this is addressed by

TSI LOC PAS (2011/291/EU) 4.2.5.3.:

"Criteria for a train departing from a platform:

"A train is deemed to be departing from a platform during the period of time elapsing between the moment when door status is changed from 'released' to 'closed and locked' and the moment when the last vehicle has left the platform.

This moment shall be detected by an onboard device. If the platform is not physically detected, the train is deemed to have left the platform when:

— the speed of the train reaches 15 (+/- 5) km/h, ***or:***

— the distance covered is 100 (+/- 20) m,

whichever occurs first."

Discussion

The first requirement is based on presence of an on-board device to physically detect the platform. This is not common practice and therefore practically all RST will need to comply with the combination of the two later requirements.

Assuming linear acceleration a train accelerating covers the distance:

$$s=1/(2a)*v^2.$$

Further: 3.6km/h=1m/s.

Modern train sets accelerate typically with 0.8 m/s² to 1,2 m/s².

Assuming typically 1m/s² this would result in a distance of s=8.7m travelled within 4,1s until reaching 15km/h. This timeframe is considered to be too low to allow passengers to notice an incident and to react and activate an emergency brake device.

Further the second requirement of 100m distance to be covered would (with the exclusion of extremely slow accelerating trains) never become relevant.

In our opinion, the speed limit of the train as stated above is given in a false unit, and therefore it should be corrected to 15 (+/- 5) **m/sec.**

Assuming again typically 1m/s² this would result in a distance of s=112,5m travelled within 15s until reaching 15m/s. This timeframe is considered to be reasonable for passengers to notice an incident and to react and activate an emergency brake device.

Further it very obviously relates well to the third requirement of 100m distance to be covered.

Conclusion

Without correcting the speed value above stated, the distance covered would be

already reached after approximately 9 m which appears to contradict the safety related intention of defining a **Platform Zone**. It is therefore considered to be in conflict with the essential requirements SAFETY as defined within 2008/57/EC.

RFU PROPOSAL

NB-Rail has made ERA aware about this issue.

It is anticipated, that an appropriate process of review and revision of the TSI LOC&PAS 2011/291/EC 4.2.5.3 would be initiated. Due to the expected duration of this process, it is considered that until a revised TSI is applicable this RFU shall inform Applicants and NoBos about the issue and provide an initial course of action until the anticipated revision of TSI LOC&PAS 2011/291/EC becomes applicable.

Each Subsystem has to comply with all essential requirements.

The requirement TSI LOC&PAS 2011/291/EC 4.2.5.3 first indent:

*"— the speed of the train reaches 15 (+/- 5) **km/h**, or"*

is not considered to satisfy the essential requirement SAFTEY of 2008/57/EC.

Instead either:

1) The alternative requirement

*"— the speed of the train reaches 15 (+/- 5) **m/s**, or"*

shall be employed, as this is considered to satisfy the essential requirement SAFETY.

2) An alternative requirement replacing the first indent of 4.2.5.3 shall be established by the Applicant by employing a risk based approach according to CSM 352 of 2009. The NoBo shall evaluate, whether this alternative requirement complies with the essential requirement SAFETY and in case of compliance use the alternative requirement in the EC verification procedure.

DATE OF AGREEMENT AT NB RAIL PLENARY MEETING

08/05/2013