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Memo

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Onderwerp

Comment on Draft Recommendation 006REC1078

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Opinion of the Fire Service Academy (as part of the Institute for Safety (IFV)) with regard to the European Union Agency for Railways (ERA) Draft Recommendation 006REC1078 on the revision of the technical specification for interoperability relating to 'safety in railway tunnels'.

Introduction

The Institute for Safety is the institute for disaster relief and public crisis management in the Netherlands. Focus is on helping the 25 safety regions if it comes to reinforcing fire services and dealing with contingency plans and crisis management.

The Fire Service Academy, part of the Institute for Safety, takes care of the permanent professional competence of fire service employees and people employed in the field of crisis management and disaster relief. The Fire Service Academy develops and offers education for employees from officer level and develops educational material for the entire Fire Service in the Netherlands. The academy also carries out (scientific) research in the field of fire suppression and fire prevention. The Fire Service Academy and the Institute for Safety comprises professorships of Fire Safety, Fire Service Science, Transportation Safety and Crisis Management.

The Fire Service Academy has been made aware of the suggested wording of article 4.2.1.3. (a) (3) of the Proposal for a revised technical specification included in the Draft Recommendation 006REC1078 and asked themselves if this will lead to a decrease in fire safety (including the save evacuation in case of a fire). We understand that the above-mentioned article is based upon ERA Technical Opinion ERA/OPI/2018-2. Hence the Fire Service Academy comments will mainly relate to specific sections of the ERA Technical Opinion to oppose the new formulation of the above-mentioned article.

Problem definition

The European Commission has asked ERA to provide an opinion on a possible change of the Commission *Regulation (EU) No 1303/2014,* concerning railway tunnels longer than 1 km. In the current Commission regulation, the following is stipulated with regard to the application of cables:

> *"In case of fire, exposed cables shall have the characteristics of low flammability, low fire spread, low toxicity and low smoke density. These requirements are fulfilled when the cables fulfil as a minimum the requirements of classification B2CA, s1a, a1, as per Commission Decision 2006/751/EC."*

This demand therefore consists of a performance requirement, followed by the prescriptive requirement, that indicates how the performance requirement is to be met. Hence it is evident which minimal cable classification needs to be applied in order to fulfil the performance requirement.

In the proposed change, the performance requirement is still maintained, *"The exposed cables shall have the characteristics of low flammability, low fire spread, low toxicity and low smoke density",* while the prescriptive requirement– i.e. *"these requirements are fulfilled when the cables fulfil as a minimum the requirements of classification B2ca,s1a,a1,"*- is omitted.

The consideration to change was initiated by the European Rail Infrastructure Managers (EIM). The European Commission asked the European Union Agency for Railways (ERA) about their opinion on this option. Hereupon ERA informed the European Commission that they regard the current requirement as being unnecessarily strict, leading to illegitimate high costs. So ERA supports a modification of the current Commission regulation.

The opinion has now been integrated by ERA in their suggested article 4.2.1.3. (a) (3) of the Proposal included in the Draft Recommendation 006REC1078 on the revision of the technical specification for interoperability relating to 'safety in railway tunnels'. Parties are given the opportunity to react on the Draft Recommendation, including the new wording of the above-mentioned article by 16 October 2018.

Observations and considerations

To approach this subject, documents underlying the fire safety requirements for cables were consulted with regard to the following question:

1) What are the quality differences of cables with regard to flammability, fire spread, toxicity and smoke density?

In this context, we also examined:

2) if the change might lead to an application of cables of lower quality,
3) if cables contribute significantly to flammability, fire spread, toxicity and smoke density in the case of a fire in a (train that is located in a) railway tunnel.

In the following paragraphs, the above mentioned subjects are evaluated separately.

Ad 1) Changes in relation to the use of lower quality cables with regard to the spread of fire and smoke

In the proposed change, the performance requirements are maintained. In theory that would imply that cables need to fulfil this requirement, which will lead to the conclusion that cables with a class lower than B2ca, s1a, a1, cannot be applied. This is indicated by a precise interpretation of the related European piece of legislation. So theoretically speaking, the changed regulation would not lead to a decrease in quality of the cables and therefore not to a decrease the level of flammability, fire spread, toxicity and smoke density.
However, the change is based on the idea of the EIM and ERA that the requirement of class B2ca, s1a, a1, is too strict and therefore unnecessary. So in practice, the proposed change of the regulation (i.e. the omission of the prescriptive requirement 'class B2ca, s1a, a1' will lead to the application of cables of a lower class and therefore to cables with a lower level of flammability, fire spread, toxicity and smoke density.

Ad 2) Differences in reaction of cables to flammability, fire spread, toxicity and smoke density
Comparing the different classification of cables based on the applicable European standards (e.g. EN 13501-6, EN 60332-1-2 and EN 50399), it can be concluded that cables with a classification lower than B2CA, s1a, a1, do have lower fire safety performance. Here, the flammability, fire spread, toxicity and smoke density will develop quicker than for cables of class B2ca, s1a, a1.

Ad 3) Contribution of cables to flammability, fire spread, toxicity and smoke density
Amongst others, cables provide tunnels with energy, light, fire alarm systems, railway signalling, video surveillance, as well as telephone and internet connection. Per kilometre of tunnel, the volume of cables can range from 10 to 40 kilometres. So when it comes to volume, cables form an essential part of the – possible – fire load in tunnels. Also in this respect the omission of the B2ca, s1a, a1, requirement will lead to a decrease in the level of flammability, fire spread, toxicity and smoke density.

Motivation of ERA
Subsequently, we evaluated the motivation of ERA to approve the proposed change. In this respect, we didn't take into account any financial and juridical aspects, but only focused on those concerning the fire safety of tunnels.

The consideration of ERA not to link the proposed change to issues of fire safety is based on the assumption that a train, in which a fire is signalled, will proceed to a safe spot (if possible outside of the tunnel), where evacuation or extinguishing processes will be initiated. As far as we know however, no risk analyses or failure probabilities are calculated which would justify the assumption of ERA. Furthermore, incidents are known in which a train on fire did not succeed in exiting the railway tunnel, leading to evacuation and rescuing processes inside the tunnel.

Hence the conclusion of ERA, that there is only a small risk of a situation that would lead to rescue or evacuation processes inside a tunnel, is not evidence-based. We will definitely not share their conclusion at this point, as it cannot be assured that a train will always be able to exit the tunnel in case of a fire.

Therefore the conclusion of ERA, that the application of B2ca, s1a, a1, cables does not enhance the safety of train passengers and staff, can't be sustained.

Conclusion

Taking all the above mentioned into consideration, the Fire Service Academy concludes the following with regard to the ERA Technical Opinion to change the fire safety requirements of cables in railway tunnels upon which the new suggested article 4.2.1.3. (a) (3) is based:

1. There is no guarantee that a train on fire, that is located in a railway tunnel, will always proceed to a safe spot.
2. Therefore, there is a realistic chance that an evacuation or rescue of people needs to take place *inside* a railway tunnel.
3. Cables can be identified as a major part of the fire load in railway tunnels.
4. Cables of class C, D or E contribute to a greater development of flammability, fire spread, toxicity and smoke density than B2ca, s1a, a1, cables.
5. Based on the proposed change, cables of class B2ca, s1a, a1, will not be applied anymore in tunnels, but instead cables of class C and D will be installed.
6. The proposed change will lead to a decrease of the fire safety in railway tunnels, and therefore also to decreased safety of train crews and passengers.

Summarizing the above mentioned aspects it has to be concluded that a scenario, in which a train stops in a tunnel and people need to escape or to be rescued, should be regarded as realistic. In that case, the contribution of cables to flammability, fire spread, toxicity and smoke density will play an important role. The proposed change might lead to an application of class C, D and E cables, which can have a strong negative influence on the evacuation or rescue of people in case of a fire. We do not know of any risk analysis or calculated failure probability which may lead to a different conclusion.

The instruction of the Dutch fire service includes information on cables being one of the most important fuels in tunnel fires. Besides it states that (suppressive) actions are highly undesirable in tunnels filled with smoke.

The Fire Service Academy therefore advises against the proposed change of article 4.2.1.3. (a) (3), and urges on the maintenance of the explicit requirement of B2 cables in railway tunnels as in the current Commission Regulation (EU) No 1303/2014 . However if changes are considered, they at least should be substantiated by a thorough risk analysis.