

EN 45545 in Transition – a GB Perspective

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Summary

This paper describes from a RSSB perspective the transition from national standards in Great Britain (GB) to a full application of European regulations and the GB strategy for a full implementation of European Standards, the issues that arise and how the process is being managed.

Keywords: LOC&PAS TSI, EN 45545, GB national standards, Fire, Seats, RSSB, Research

1. Introduction

RSSB is owned by the GB rail industry but is non-profit-making and independent of any commercial interests. RSSB spans the whole rail system, including in its membership infrastructure companies, train and freight operators, rolling stock owners and suppliers to the industry.

RSSB supports its members in the privatised GB rail industry where cooperation is required between them and provides support and facilitation for cross industry activities. RSSB manages industry-wide programmes of research, development and innovation in cooperation with Department for Transport, Network Rail and other partners.

Part of RSSB's role is to develop the content of national Railway Group Standards (RGSs), the Rule Book and other standards as agreed by the industry. RSSB is an active part of the European standardisation process and, on behalf of the BSI, provides the secretariat for those committees that mirror ENs relating to railway applications in both CEN and CENELEC. RSSB supports the GB representatives who are members the working groups that draft the standards.

2. TSI requirements

The LOC&PAS TSI [13] which came into force 1st January 2015 sets out mandatory train fireworthiness requirements for:

- Materials – EN 45545-2 [5],
- Fire containment – passive fire barriers – but does not refer to EN 45545-3 [6],

- Active FCCS systems – open point, a new standard is being prepared,
- Fire detection and extinguishers – see TSI application guide, EN 45545-6 [13] gives presumption of conformity,
- Flammable liquids – the TSI application guide refers to EN 45545-7 [10],
- Continued operation – EN 50553 [11] is specified,
- Emergency exits – the TSI application guide refers to EN 45545-4 [7].

It should be noted that EN 45545-1 [4], EN 45545-3 [6] and EN 45545-5 [8] are not referred to in either the LOC&PAS TSI or the application guide.

3. TSI transitional period issues – GB national standards

The LOC&PAS TSI (7.1.1.5) allows British, French, German, Italian, Polish, and Spanish national standards for materials properties to continue in use during a three year transitional period until 1st January 2018.

The GB national standard is the Railway Group Standard GM/RT 2130 Issue 4 [12] which specifies the application of BS 6853:1999 [3]. Prior to the introduction of the current LOC&PAS TSI the requirements of GM/RT 2130 were mandatory for vehicles used on the national network.

As the LOC&PAS TSI regulations come into effect the current GB situation has become complicated:

- The LOC&PAS TSI allows application of EN 45545-2:2013 already, without any qualification,

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- In GB the TSI also permits application of national standards GM/RT2130 and BS 6853 until 1/1/2018,
- GB Railway Group Standards like GM/RT2130 are no longer mandatory for the GB rail industry except where specific parts are Notified National Technical Rules,
- The other parts of GM/RT2130 therefore become „voluntary”, to be used as accepted methods to control foreseeable hazards,
- BS 6853, due to a mismatch between TSI and EN timetables, now has a „withdrawn” status.

The agreed strategy for the GB rail industry is, for areas outside of the scope of the TSIs which are mandatory, where the standards applied remain voluntary, to become fully aligned with the European standards regime.

In 2013 the GB national standard GM/RT 2130 adopted key aspects of the European regime such as operational categories in preparation for the full adoption of EN 45545. Using the findings of RSSB research project T843 [2] relationships were defined between the European operational categories and hazard levels and the BS 6853 categories.

4. TSI problems – GB perspective

The LOC&PAS TSI, in mandating EN 45545-2:2013, does not acknowledge the known issues with EN 45545-2, in particular Annex B. In the event of an accident it would be difficult to justify to an inquiry or court the application of EN 45545-2 Annex B for complete seats in consideration of what we currently know about:

- the comments included in the National Forward to BS EN 45545-2:2013,
- the results of the RSSB T1018 [1] research which demonstrate that the Annex B test as published in EN 45545-2:2013 fails to discriminate between the fire performance of different types of seats,
- the work undertaken to prepare prEN 16989 [14] to replace EN 45545-2 Annexes A and B with a comprehensively revised fire test.

When EN 16989 is completed, published and referenced in an amended EN 45545-2, a European consensus will have been reached and the GB concerns will have been addressed and therefore the difficulty will disappear.

5. Work in progress – development of EN45545

CEN TC 256 WG1 are currently working on the revision of the EN 45545 series. The work is complex and is more fully described in other papers. The Table 1 summarises the overall task.

Table 1

EN 45545 work program

Current situation	Target situation	Notes	
EN 45545-1	EN 45545-1	To be reviewed	
EN 45545-2	EN 45545-2	Amendment A1 2015, new amendments required to include new test procedures.	
	Annex A	EN 16989 (seats)	
	Annex B		Enquiry launched May 2016
	Annex C	EN? (toxicity)	Drafted
	Annex D	–	Annex Retained?
EN 45545-3	EN 45545-3	To be reviewed	
EN 45545-4	EN 45545-4	To be reviewed	
EN 45545-5	EN 45545-5	Amendment A1 2015	
EN 45545-6	EN 45545-6	To be reviewed	
EN 45545-7	EN 45545-7	To be reviewed	
	EN? (FCCS)	Drafting started	

6. Transition – common GB issues

BS 6853 now has an official „withdrawn” status and this causes considerable confusion because it is not always realised that BS 6853 can continue to be used until 2018. For practical purposes the withdrawn status is not relevant because the standard still exists as a freely available document that is in the public domain.

An additional problem relates to the GB reservations about the complete seat fire test. The current test Annex B is in an official published European standard and therefore the position is often questioned. It is not widely appreciated that the whole EN 45545 series had to be initially published as a complete set even though not all parts were finished. When EN 45545 was published in 2013 there were therefore a number of significant unresolved technical comments, in particular relating to the complete seat test.

It should however be noted that all parts of EN 45545 were voted positively by GB, except for EN 45545-2 because of the seat test.

As part of a policy of alignment and convergence with the European fire standards, using the findings of RSSB research projects T843 and T1018, it has been possible to define an equivalence between the BS 6853 categories and EN 45545 hazard levels. There are therefore no grounds not to apply almost all of the current EN 45545 if materials conforming to BS 6853 cannot be economically sourced.

7. Looking forward

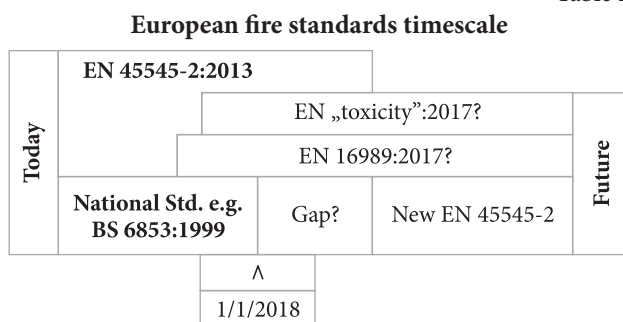
For GB the critical element in the set of European fire standards is the complete seat fire test, which was the reason why GB voted against EN 45545-2. Since then significant progress has been made for a revised test method and the draft standard represents a significant and positive step forward.

When the new complete seat fire test is published as EN 16989, the final task for rail vehicle seats will be to agree acceptance criteria for the different hazard levels will need to be agreed in an amended EN 45545-2. This will be followed by incorporating the new toxicity test standard and then attention can turn to more general revision in the light of experience of applying the EN 45545 series.

The timing of these changes to EN 45545-2 is a critical issue. From the 1st January 2018 the only permitted standard for the fire performance of materials for rail vehicles will be EN 45545-2. If the publication of EN 16989 and the necessary amendment to EN 45545-2 do not happen before the 1st January 2018 there will be a problem as the LOC&PAS TSI directly specifies EN 45545-2:2013.

It is anticipated that if necessary a method to work around such a possibility will be agreed with the European Rail Agency should the timings fail to align by either a change directly to the LOC&PAS TSI or to its application guide. Diagrammatically the approximate timings for the development of EN 45545-2 are illustrated in Table 2.

Table 2



8. Approach currently suggested for design in GB

In consideration of the present transitional situation, with EN 45545 undergoing revision and completion, for GB, the recommended way forward until the complete seat testing regime is agreed, ideally before 1st January 2018, is to:

- For material properties continue with BS 6853 or apply EN 45545 for the relevant Operational

Category throughout with the exception of the seats,

- Seats should continue to be tested to the appropriate BS 6583 category e.g. Cat 1b for HL2 and Cat 1a. for HL3 vehicles.

Elsewhere, where there are equivalent measures in the EN 45545 series, compared to those in the national standards GM/RT 2130 and BS 6853, these may be applied in place of requirements in GM/RT2130.

9. Conclusion

The GB rail industry has to conform to European directives and regulations. Where standards are voluntary, the strategy is to adopt European standards wherever possible to replace national standards so that the benefits of a single market can be realised, to increase the number of potential suppliers and, through competition and economies of scale, reduce costs.

In terms of rail vehicle fire safety, the objective is that after 1st January 2018 GB will be applying only EN 45545 (with EN 16989 and EN „toxicity” etc.) to manage and control all our fire related hazards.

Literature

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2. Assessment of TS 45545 Fire Testing Regime For GB Conditions; T843 – September 2011, RSSB, London. Available from www.sparkrail.org.
3. BS 6853: 1999 Code of practice for fire precautions in the design and construction of passenger carrying trains.
4. EN 45545-1:2013 Fire protection of railway vehicles – Part 1: General.
5. EN 45545-2:2013+A1:2015 Fire protection of railway vehicles – Part 2: Requirements for fire behaviour of materials and components.
6. EN 45545-3:2013 Fire protection of railway vehicles – Part 3: Fire resistance requirements for fire barriers.
7. EN 45545-4:2013 Fire protection of railway vehicles – Part 4: Fire safety requirements for railway rolling stock design.
8. EN 45545-5:2013+A1:2015 Fire protection of railway vehicles – Part 5: Fire safety requirements for electrical equipment including that of trolley buses, track guided buses and magnetic levitation vehicles.
9. EN 45545-6:2013 Fire protection of railway vehicles – Part 6: Fire control and management systems.

10. EN 45545-7:2013 Fire protection of railway vehicles – Part 7: Fire safety requirements for flammable liquid and flammable gas installations.
11. EN 50553:2012 Railway applications – Requirements for running capability in case of fire on board of rolling stock.
12. GM/RT2130 Issue 4, Vehicle Fire, Safety and Evacuation. December 2013.
13. LOC&PAS TSI – COMMISSION REGULATION (EU) No 1302/2014 of 18 November 2014 concerning a technical specification for interoperability relating to the ‘rolling stock – locomotives and passenger rolling stock’ subsystem of the rail system in the European Union.
14. prEN 16989:2016 Railway applications – Fire protection on railway vehicles – Fire behaviour test for a complete seat.

Norma EN 45545 w okresie transformacji z perspektywy brytyjskiej

Streszczenie

W artykule opisano okres transformacji norm krajowych w Wielkiej Brytanii widziany z perspektywy RSSB (*Rail Standard and Safety Board* – Rada ds. Normalizacji i Bezpieczeństwa Kolei) prowadzący do pełnego zastosowania europejskich regulacji prawnych. Przedstawiono brytyjską strategię pełnego wdrażania norm europejskich oraz problemy zarządzania tym procesem.

Słowa kluczowe: LOC&PAS TSI (Techniczna Specyfikacja Interoperacyjności Tabor – Lokomotywy i Tabor Pasażerski), norma EN 45545, normy krajowe Wielkiej Brytanii, pożar, siedzenia, Rail Standard and Safety Board – Rada ds. Normalizacji i Bezpieczeństwa Kolei), badania naukowe

Норма EN 45545 во время трансформации с британской точки зрения

Резюме

В статье описано время трансформации с точки зрения RSSB (*Rail Standard and Safety Board* – Совета железнодорожных стандартов и безопасности) с национальных норм в Великой Британии по полное внедрение европейских правовых норм, британская стратегия полного внедрения европейских норм, а также проблемы, возникающие в этой сфере и способ управления этим процессом.

Ключевые слова: LOC&PAS TSI (Технические спецификации для интероперабельности – локомотив и пассажирский подвижной состав), норма EN 45545, национальные нормы Великой Британии, пожар, Rail Standard and Safety Board – Совет железнодорожных стандартов и безопасности, научные исследования