Revision Process of EN 45545

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Summary
The paper presents a standardization process of the standard EN 45545, established for the last 22 years, and one of the longest in the history of the CEN / CENELEC.
The difficulties to complete this work were caused by the fact that different countries have been developing various test methods and classification systems as well as methods for assessing the level of fire risk.
This standard was established in March 2013, but because of the demonstrated its inadequacy, in 2014 it was recreated as a new working group CEN TC 256 WG1 for its revision.
The paper presents the scope and schedule for the planned verification of EN 45545 standard, taking into account:
- Revision EN 45545 Parts 1 to 7,
- Developing a new standard for the seat testing,
- Developing a new standard for the smoke and toxicity testing,
- Developing a new standard for Fire Containment and Control Systems (FCCS).
Key words: fire protection, rolling stock, fire and smoke properties, CEN / CENELEC

1. Introduction

The paper presents a standardization process of the standard EN 45545, established for the last 22 years, and one of the longest in the history of the CEN / CENELEC.

The difficulties were caused by the following reasons:
- different countries use different technological solutions in production, as well as different principles of operation and maintenance of rolling stock,
- different fire types and circumstances (e.g., failure in the brake or heating systems, short circuits in electrical installation, arson, etc.) which led to new test methods in order to recreate potential ignition sources in the laboratory,
- different countries have been developing various test methods and classification systems as well as methods for assessing the level of fire risk,
- replacement of traditional materials with plastics lead to the development of new solutions in design and vehicle construction (e.g. policarbonates).

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Continuous development of technological solutions and better knowledge on the fire development in a moving rail vehicle, has exhibited imperfections of EN 45545. There is a need for harmonized European requirements, because:

- European Rail Market requires the same approach and one type tests should follow across Europe,
- European interoperability network requires the same safety rules across Europe.

These requirements should also ensure the necessary level of fire safety and should be sufficient to keep the hazard level low. On these bases, European Standardization bodies decided revise EN 45545.

2. Structure and Principles of Work of European Standardization

There are three following European Standardization Organizations:

1. **CEN** (*fr*. ***C****omité* ***E****uropéen de* ***N****ormalisation)* the European Committee for Standardization – responsible for standardization in the fields and sectors including: air and space, chemicals, construction, consumer products, defense and security, energy, the environment, food and feed, health and safety, healthcare, ICT, machinery, materials, pressure equipment, services, smart living, transport and packaging [www.cen.eu],
2. **CENELEC** (*fr. **C**omité **E**uropéen de **N**ormalisation **Élec**trotechnique*) the European Committee for Electrotechnical Standardization – responsible for standardization in the electrotechnical engineering field [www.cencelec.eu],
3. **ETSI** (*eng. **E**uropean **T**elecommunications **S**tandards **I**nstitute*) the European Telecommunications Standards Institute, produces globally-applicable standards for Information and Communications Technologies (ICT), including fixed, mobile, radio, converged, broadcast and internet technologies [www.etsi.org].

These have been officially recognized by the European Union and by the European Free Trade Association (EFTA) as being responsible for developing and defining voluntary standards at European level. There are following members of these European Standardization Organizations:

1. CEN: the National Standardization bodies in 33 European countries;
2. CENELEC:
   - members – the National Standardization Bodies in 30 European countries,
   - affiliated members – NSB of 9 countries neighboring of UE, that are members or associate members of the International Electrotechnical Commission IEC;

3. ETSI:
   - members – 672 institutions (NSB and scientific institutes or other cooperation institutions), including of 35 from European countries,
   - associate members – 191 institutions including of 19 from European outside countries),
   - observers – 49 Institutions only from European countries.

The scheme of cooperation standardization organizations in the field of Railway applications is presented Figure 1 [4].

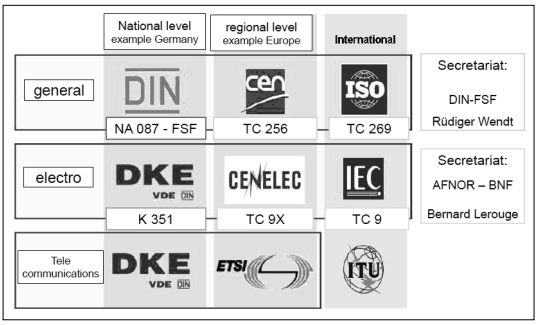

Fig. 1. Scheme of cooperation standardization organizations in the field of Railway applications [4]

Normalization in the area of fire safety rolling stock is carried out by CEN / / CENELEC. Below short description of CEN / CENELEC work rules are presented.

- Each country has one member in each standardizing body (usually it is the national standardization organization).
- All bodies, such as the general assembly, political and technical management committees, and standards committees, are open to all members.
- Affiliated standardization bodies and associated organizations have observer status.
- The CEN / CENELEC national members shall ensure that the experts they nominate in a Working Group are aware of the CEN / CENELEC Internal Regulations and agree to contribute to the work of CEN / CENELEC in accordance therewith.

Moreover, CEN / CENELEC declare following objective: Harmonization of national standards in all member states through uniform adoption of European Standards, and following mission: Lower trade barriers and create identical competitive conditions throughout the European Single Market. These Committees have also own Standstill Policy:

- During work on a European Standard, and after its publication, CEN/CENELEC members agree not to publish national standards which are not in line with it.
- This policy aims to prevent any situation occurring during preparation or after publication of a standard which could impair or undermine harmonization.

Stages of CEN / CENELEC standards work presents Figure 2.

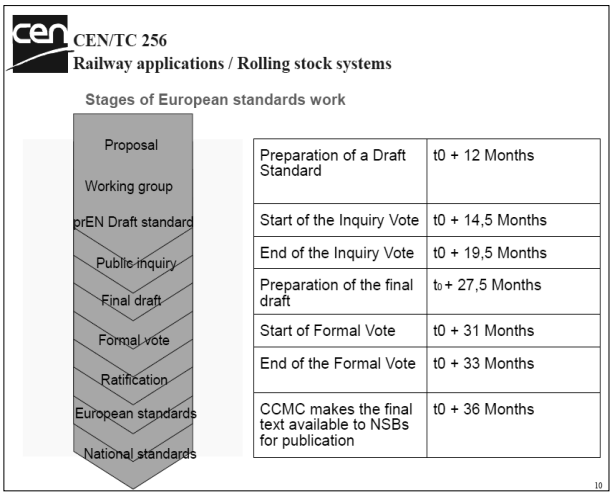

Fig. 2. CEN / CENELEC – stages of European standards work [1]

3. Rewiev of EN 45545

CEN TC256 taken following resolutions on Plenary Meeting (13 of November, 2013):

- Resolution for reactivation of CEN TC 256 WG1;
- Resolution for the name of the convenor of this new group (Serge Metral, SNCF);
- Resolution for working in „Mode Four" with CENELEC TC9X;
- Following the presentation in Brussels last technical meeting of CEN TC 256 and in Lisbon (last CENELEC TC9X meeting): starting the revision of parts 1, 2, 5 and 6 by amendments on comments proposed by the Survey Group;
- Call for Experts for this new CEN TC 256 WG1 for these amendments.

Accordingly, reactivation of WG1 Fire Protection is the CEN TC 256 decision. At the same time it must be emphasized that the European Commission has set a high priority on the EN 45545 standard series. The scheme of CEN TC 256 presented on Figure 3.

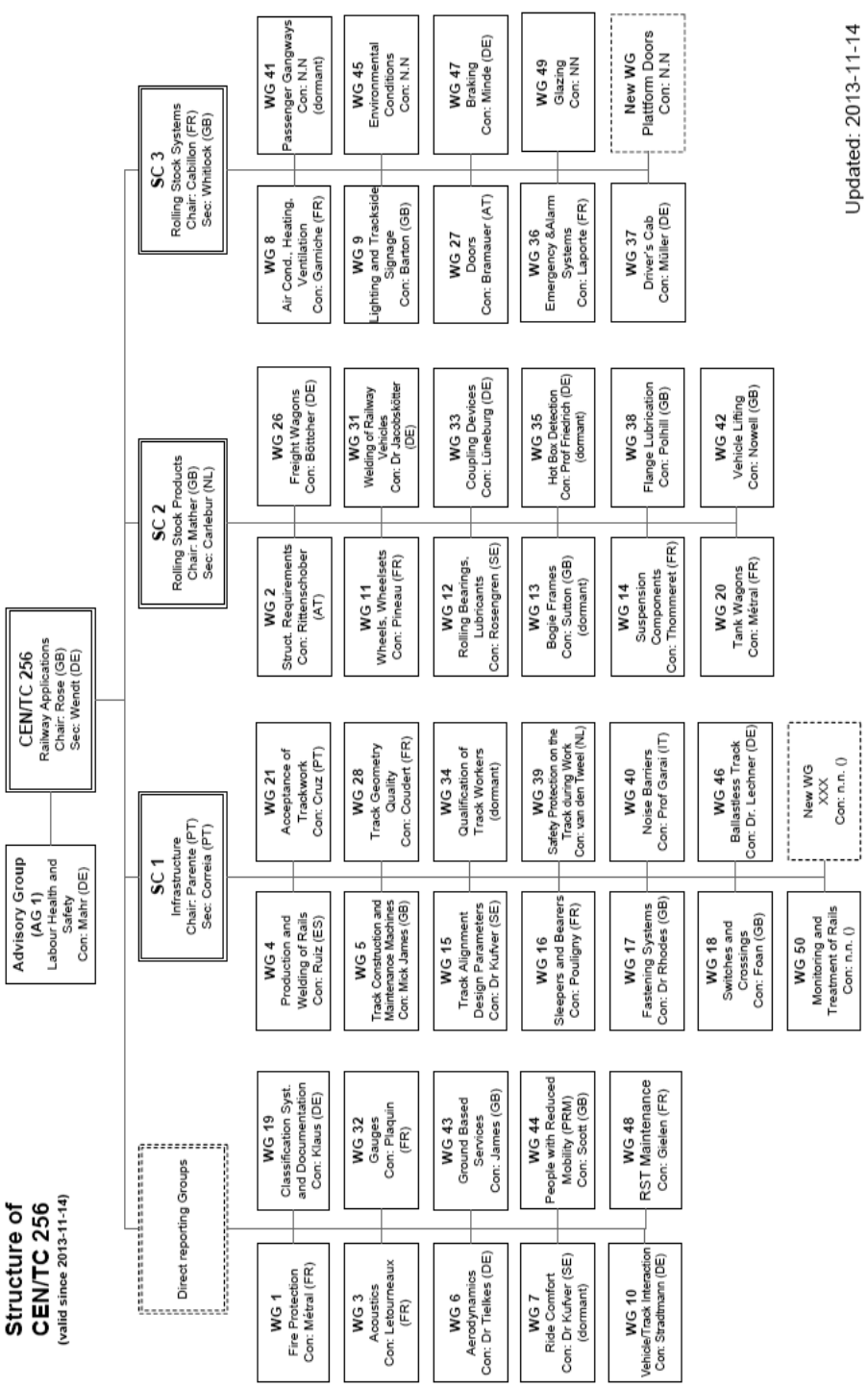

Fig. 3. Scheme of structure of CEN TC 256 [4]

CEN TC 256 WG1 agreed that the following outcome is proposed for the final set of standards (Figure 4) [2]:

1. Revision of EN 45545 Parts 1 to 7;
2. A new standard for seat testing:
   - Developed from Annexes A, B and D of Part 2;
   - The revised Part 2 will refer to this and the Annexes will be removed;
3. A new standard for smoke and toxicity testing:
   - Developed from Annex C of Part 2 and Transfeu Project [3];
   - The revised Part 2 will refer to this and the Annex will be removed;
4. A new standard for Fire Containment and Control Systems (FCCS):
   - After report of TC 256 FCCS survey group.

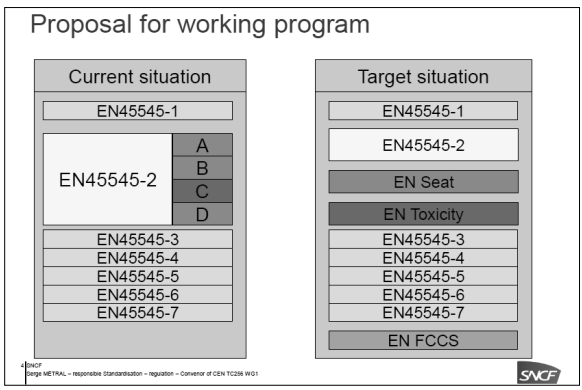

Fig. 4. Proposal for changes in the standard EN 45545 [2]

Additionally, members of WG1 accepted the following rules of work:

1. The survey group of JWG had the task to sort comments from formal vote enquiry and from TS to EN enquiry not taken into account and it selects few of them.
2. For each selected comment, an analysis will be done and the result is one the third possibilities:
   - Accepted with a proposal for amendment;
   - Not longer relevant because … (with a reason);
   - To be studied and resolved during the next revision.
3. Because the revision process is scheduled for few years, some changes have to be done as soon as possible.
4. A small group of comments will therefore be proposed for immediate action by amendment according to the following criteria:
   - Where on current projects the application of the standard makes contradictory demands or
   - The standard is now not in accordance with the TSI.

CEN TC 256 WG1 adopted carrying out the work in described below three steps.

First step

1. Amendment of Parts 2 and 5:
   - EN 45545-2 should be amended for few comments on the main text;
   - EN 45545-5 should be modified by an amendment for the batteries.
2. EN 45545-1, EN 45545-3, EN 45545-4, EN 45545-6 and EN 45545-7, no relevant comments are identified to justify an immediate revision by amendment:
   - 2 proposals of NWI to work only on selected comments chosen by the Survey Group for Parts 2 and 5;
   - Subgroups have to give answers of all comments from previous enquiries (TS to EN and Formal vote).

Second step

Work on the new standards:

- Toxicity tests on material for railway rolling stock (starting point Annex C of current EN 45545-2);
- Fire behaviour tests on seats for railway rolling stock (starting point Annexes A, B and D of current EN 45545-2);
- FCCS (Fire Containment Control Systems) according RFS of ERA.

Third step

Revision of EN 45545:

1. Revise EN 45545-1 to EN 45545-7 (all parts) to close comments and take account of experience with the published standard:
   - In particular modify EN 45545-2 by removing annexes and making references instead to the new testing standards for seat, smoke and toxicity;
   - In particular modify EN 45545-6 by making reference to a new FCCS standard.

Proposal of schedule for the revision are presented on Figure 5 [2].

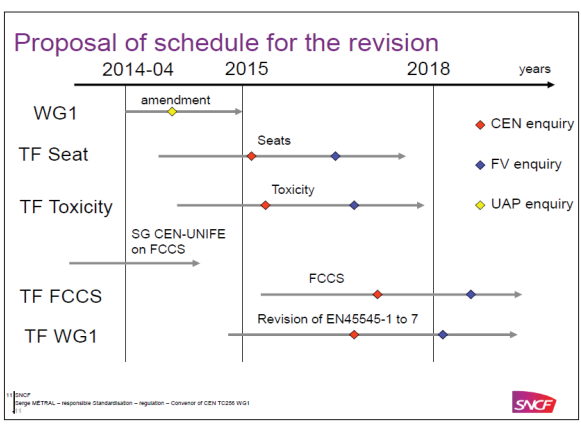

Fig. 5. Proposal of schedule for the revision of EN 45545 [2]

Proposal of organization of CEN TC 256 WG1 are presented on Figure 6 [2]. As shown, WG1 have the following constitution:

- Convenor of CEN TC 256 WG1;
- Secretary of CEN TC 256 WG1;
- 3 members of Railway Undertakings;
- 3 members of Vehicles Producers.

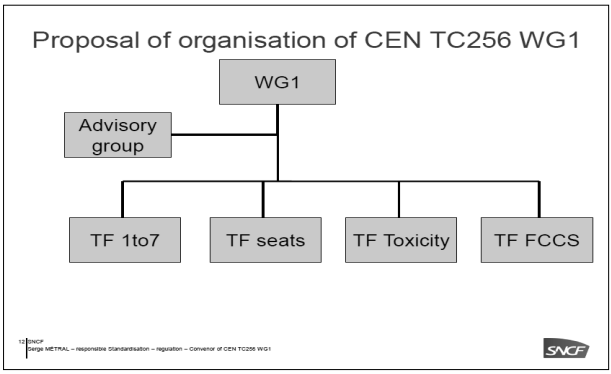

Fig. 6. Proposal of organisation of CEN TC 256 WG1 [2]

The role of Advisory group are:

- Check the consistency of the documents prepared by the Subgroups before enquiries;
- Help to define and manage the strategy to be followed by the CEN TC 256 WG1.

During CEN TC 256 plenary meeting in Berlin 13 of November, 2013, it was asked to have a UNIFE – CEN TC 256 WG1 Survey Group to assess if pre-normative research is needed and to propose a scope for a FCCS standard. Report from this Survey Group is expected at the CEN TC 256 plenary meeting of November 2014 for the final decision. Then results will be presented at the beginning of 2015 to ERA, UNIFE, CER, NSA. If research is needed, then CEN TC 256 will wait for the results before activating SG FCCS.

Members of CEN TC 256 WG1 agreed additional following work rules:

1. Each subgroup has to follow the normal rules for working (maximum 3 experts per NSB in a meeting);
2. Subgroups have to give answers of all comments from previous enquiries (TS to EN and Formal vote);
3. Subgroups have to respect:
   - The scope of the documents;
   - The content of Work Item;
   - The request for standard (where applicable);

4. Once points are agreed, there is no attempt to reopen them – even if a new member will join the WG.

4. Conclusions

There are following history and current situation referring develop of EN 45545 Railway applications – Fire protection of railway vehicles:

- 1991–2013 – time to develop EN 45545 standard;
- March 2013 – March 2016 - a three-year transition period for CEN member states to withdraw the existing national standards and to implement changes into EN 45545 standard;
- 2014 – started a new working group CEN / TC 256 / WG 01, which will verify the standard EN 45545 to 2018;
- CEN TC256 and European Commission as well as all other users of this standard are hoping that the revision time will be met and that the verified standard will be accepted and clearly understood by all.

Literature

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