BUSINESS PLAN
CEN/TC 433
ENTERTAINMENT TECHNOLOGY
EXECUTIVE SUMMARY

Business Environment

- European business within entertainment technology leads the world market and covers from 60 to 70% of the major projects, refurbishments and events.

- The safety of performing artists, the crew (technical personnel) and the audience are of paramount importance and numerous specific safety requirements are important and specific to standardization of equipment.

- The entertainment industry has a large number of types of venues. Persons in the theatres and entertainment industry work together over Europe.

- A large number of systems are provided or rented for shows, touring around different countries.

  Parties involved:
  - performing industry (theatre, production companies, musicians);
  - creative agencies (event agencies; concert promoters);
  - entertainment and event technology suppliers (manufacturers, service providers);
  - production venues (concert & convention halls, theatres, exhibition & event locations);
  - performers, technicians and licensing authorities as well as audience members;
  - theatre and stage engineering consultants;
  - Certification and testing authorities.

Benefits

- The main benefit will be to develop a set of standards for machinery, technical installations and work equipment used in the Entertainment Industry to simplify trade business and touring productions in different locations across Europe.

- Machinery used in this area is mostly within directive 2006/42/EG (machinery directive), but machinery intended to move performers during artistic performances (e.g. stage elevators) is excluded from this directive (Article 1, §2, (j)). Common and specific safety standards within Europe for both types of machinery use have to be ensured.

- In several EU member states different requirements and standards exist. Major theatre-building-projects in Europe refer to national standards what creates trade barriers over Europe. The standardization work in this field should help that all systems used within this industry fulfill the same minimum safety requirements and to harmonize the different existing national standards.
Priorities

Creation of European Standards, Technical Specifications and Technical Reports on

- Lifting and Load-bearing Equipment for Stages and other Production Areas within the Entertainment Industry.

- Design, manufacture and for use of aluminium and steel trusses and towers.

- Terms and definitions to be worked out as a result of standardization work in other Working Groups and clarification of terminology for CEN languages and translations.

- Codes of practices for competency requirements e.g. installation, safe use, maintenance, inspection and safe removal of entertainment technologies.
1 BUSINESS ENVIRONMENT OF THE CEN/TC

1.1 Description of the Business Environment

The following political, economic, technical, regulatory, legal, societal and/or international dynamics describe the business environment of the industry sector, products, materials, disciplines or practices related to the scope of this CEN/TC, and they may significantly influence how the relevant standards development processes are conducted and the content of the resulting standards:

Entertainment technology is an interdisciplinary field with specific technology and unique safety requirements. There are places of assembly, staging and production areas for events and theatrical productions. Such locations include but are not limited to theatres, multi-purpose halls, exhibition halls; film, television, photography and radio studios as well as facilities in concert halls, museums, schools, bars, discotheques, open-air stages and other places for shows and events. In some cases, atypical non-performance spaces are also used. These “special event locations” require special attention.

The safety of performing artists, the crew (technical personnel) and the audience are of paramount importance.

These people have a right to expect that any entertainment production is safe and that people involved with the realization used reasonable care and judgment.

Numerous specific safety requirements are important and specific to standardization of equipment:

- Theatre stages and production areas are places where persons may be working under suspended loads without any personal protective equipment (PPE).
- Loads may be moved above unprotected persons and above persons who are not familiar with the situation.
- Loads are moved above non-restricted areas.
- Several types of loads may be moved simultaneously.
- Machinery and loads may be handled in darkness and with additional limitations of visibility (e. g. artificially created fog).
- Loads may be moved at high speed.
- Lifting systems, mainly in theatres and opera houses may be used as stage elevators, orchestra pit elevators and traps for transports of persons and scenery. These lifting systems have similarities to elevators but move faster, in darkness, with reduced protective facility, requiring numerous persons to be transported.
- risks or hazards involved when operators are manipulating loads over head.

The entertainment industry has a large number of types of venues. Persons in the theatres and entertainment industry work together over Europe. A large number of systems are provided or rented for shows, touring around different countries.
1.2 Quantitative Indicators of the Business Environment

The following list of quantitative indicators describes the business environment in order to provide adequate information to support actions of the CEN/TC:

**Figures (from Germany):**

- in year 2010/2011 over 32 mio. visitors in theatres and concerts with 67 755 events and a revenue of about Euro 2.8 billion;
- 143 public theatres, 218 privately owned theatres, 131 orchestra, 73 theatre festivals;
- in year 2013 3 mio. events with about 370 mio. participants in fairs and conventions;
- 3.3 billion revenue in 2012 with trade fairs;
- the live entertainment (concerts and live performances), exhibition, and convention market generates a total revenue of Euro 66.7 billion;
- entertainment industry members generate around 3.5 billion (VPLT members) in sales a year;
- the live entertainment market generates a total yearly revenue of Euro 3.322 billion;

**Parties involved:**

- performing industry (theatre, production companies, musicians);
- creative agencies (event agencies; concert promoters);
- event technology suppliers (equipment manufacturers, service providers);
- production venues (concert halls, theatres, convention halls, exhibition buildings, special event locations);
- logistics companies;
- performers, technicians and licensing authorities;
- audience members;
- entertainment technology suppliers;
- theatre and stage engineering consultants;
- certification and testing authorities.

2 BENEFITS EXPECTED FROM THE WORK OF THE CEN/TC

The main benefit will be to develop a set of standards for machinery, technical installations and work equipment used in the Entertainment Industry.
A set of technical standards within the entertainment industry will simplify touring productions in different locations across Europe.

Machinery used in this area is mostly within directive 2006/42/EG (machinery directive), but machinery intended to move performers during artistic performances (e.g. stage elevators) is excluded from this directive (Article 1, §2, (j)). The goal is to ensure common and specific safety standards within Europe for both types of machinery use.

In several EU member states different requirements and standards exist. All major theatre-building-projects in Europe refer to own national standards for technical equipment or standards of neighbor countries as UK, Sweden, Austria and Germany. Existing national requirements standards specify different safety levels which results in uncertainty and possible risks. This creates trade barriers over Europe.

The standardization work in this field should help that all systems used within this industry fulfill the same safety requirements and to harmonize the different existing national standards. With the standardization work, a harmonized use of machinery, installations and equipment within Europe can be achieved and this will remove technical barriers to trade and open markets throughout Europe.

3 PARTICIPATION IN THE CEN/TC

All the CEN national members are entitled to nominate delegates to CEN Technical Committees and experts to Working Groups, ensuring a balance of all interested parties. Participation as observers of recognized European or international organizations is also possible under certain conditions. To participate in the activities of this CEN/TC, please contact the national standards organization in your country.

4 OBJECTIVES OF THE CEN/TC AND STRATEGIES FOR THEIR ACHIEVEMENT

4.1 Defined objectives of the CEN/TC

Standardization activities include all machinery and technical installations used to lift, lower, suspend and carry loads (e.g. scenery, truss systems, lighting, film/video and sound equipment). They may also be used to move persons, and persons may stand under such equipment while the loads are at rest or in motion.

A first attempt for European standardization work was realized in CWA 15902-1 and CWA 15902-2. However, there are no existing common European or international safety standards regarding lifting and load-bearing equipment for stages and other production areas within the entertainment industry.

At the beginning the work on CWA 15902-1 will be main topic with the aim to develop a European Standard. In the future, a harmonized class C standard associated with the machinery directive shall be established for this topic to ease conformity assessment procedure.

Working materials are part of or interface to machinery and needs to follow the same or equal safety philosophy to guarantee safe interaction and shall be addressed as well within
CEN/TC 433. Working materials in this content comprise elements for fastening, connecting and lifting as well as safety elements for portable light, image, sound and effects equipment.

Safety requirements for construction, installation and advice for safe use as well as load assumptions and testing and inspection of machinery and equipment shall be established and are an essential part of the standardization work within CEN/TC 433.

Another task of standardization shall be the application of existing general standards within the entertainment industry. This might be achieved by developing specific entertainment technology standards.

Another task will be establishing a common standard of safety that can be applied and verified by an internal validation, after performing the necessary tests in the same area of the event.

Finally, Codes of practice for operators and aspects of safety for flying systems for artists shall be established.

4.2 Identified strategies to achieve the CEN/TC.s defined objectives.

A structure with three working groups shall be established first:

**WG 1 Machinery**

The first topic of this WG will be Lifting and Load-bearing Equipment for Stages and other Production Areas within the Entertainment Industry — General requirements (excluding aluminium and steel trusses and towers)

Existing documents in Europe for this topic are:

- CWA 15902-1, *Lifting and Load-bearing Equipment for Stages and other Production Areas within the Entertainment Industry — Part 1: General requirements (excluding aluminium and steel trusses and towers)*
- BS 7905-1, *Lifting equipment for performance, broadcast and similar applications. Specification for the design and manufacture of above stage equipment (excluding trusses and towers)*
- BS 7906-1, *Use of lifting equipment for performance, broadcast and similar applications. Code of practice for installation, use and removal of above stage equipment (excluding trusses and towers)*
- CSN 91 8112, *Technological Stage Equipment. Technical security requirements*
- DIN 56950-1, *Entertainment technology — Machinery installations — Part 1: Safety requirements and inspections*
- NPR 8020-10, *Entertainment - Rigging - Design factors for safety for lifting equipment*
- NPR 8020-14, *Entertainment - Rigging - Maintenance and inspection*
- OENORM M 9630-1, *Mechanical equipment on stages — Part 1: General*
- OENORM M 9630-2, *Mechanical equipment on stages — Part 2: Upper stage machinery*
- OENORM M 9630-3, *Mechanical equipment on stages — Part 3: Lower stage machinery*
- OENORM M 9630-4, *Mechanical equipment on stages — Part 4: Mechanical devices for fire safety*
OENORM M 9631, *Mechanical equipment on stages — Operating and maintenance instructions*

OENORM M 9632, *Mechanical equipment on stages — Test procedures*

SS 7671501, *Theatre machinery and lifting equipment for stage and studio — Safety rules for construction and operation*

STN 91 8112, *Technological stage equipment. Technical security requirements*

NPR 8020-11, *Entertainment — Rigging — Manually operated flying systems for persons*

*Another topic is Lifting and Load-bearing Equipment for Stages and other Production Areas within the Entertainment Industry — Requirements on lifting equipment for setup purposes only*

Existing documents in Europe for this topic are:

CWA 15902-1 *Lifting and Load-bearing Equipment for Stages and other Production Areas within the Entertainment Industry — Part 1: General requirements (excluding aluminium and steel trusses and towers), Chapter 7*

IGVW SQ P2 Electric Chain Hoists

**WG 2 Working materials**

Topics of this WG shall be:

**Specifications for design, manufacture and for use of aluminium and steel trusses and towers**

Existing documents in Europe for this topic are:

CWA 15902-2, *Lifting and Load-bearing Equipment for Stages and other Production Areas within the Entertainment Industry — Part 2: Specifications for design, manufacture and for use of aluminium and steel trusses and towers*

BS 7905-2, *Lifting equipment for performance, broadcast and similar applications. Specification for design and manufacture of aluminium and steel trusses and towers*

BS 7906-2, *Lifting equipment for performance, broadcast and similar applications. Code of practice for use of aluminium and steel trusses and towers*

OENORM M 9633, *Event equipment — Cross arm systems — Provision, use and testing*

IGVW SQ P1, *Truss*

**Safety ropes for loads attached to load carriers**

Existing documents in Europe for this topic are:

DIN 56927, *Entertainment technology — Safety-rope to secure objects up to 60 kg self weight — Measures, requirements and testing*

NPR 8020-15, *Entertainment - Rigging - Safety ropes for loads attached to load carriers*
Aluminium platforms

Existing documents in Europe for this topic are:

- DIN 15921, Entertainment technology — Aluminium platforms and frames — Safety requirements

Loads and load assumptions - safe working load - live load - traveling load

Existing documents in Europe for this topic are:

- DIN 56955, Entertainment technology — Load assumptions in stages and associated areas — Safe working loads
- NPR 8020-51, Events — Stage structures — Loads and structural keynotes

Technical ceilings and grids

Existing documents in Europe for this topic are:

- DIN 56928, Event technology — Technical ceilings and grids — Safety requirements

Fixing and connecting elements, transition pieces for projectors, luminaires and stage equipment (TV-Lighting Spigot Eurospec)

Existing documents in Europe for this topic are:

- DIN 15560-24, Spotlights for film and television studios, stages and photographic use — Part 24: Fixing elements for projectors and luminaires, main reflector support, pipe clamp, pivot plug, socket for pivot plug for photo-luminaires and reportage-luminaires
- DIN 15560-25, Projectors for film and television studios, stage and photographic use; connecting elements and transition pieces
- DIN 15560-26, Projectors for film and television studios, stage and photographic use; fixing elements and positions for projectors

Working materials for personnel flying

Existing documents in Europe for this topic are:

- NPR 8020-11, Entertainment — Rigging — Manually operated flying systems for persons
- BS 7906-1, Chapter 9

WG 3 Terminology

Standard for Terms and definitions

Overall standard to be worked out as a result of standardization work in other Working Groups and clarification of terminology for CEN languages and translations.

WG 4 Codes of practice

Publications concerning the codes of practices.
Competency requirements for personnel

Aspects to be considered would be music, corporate, trade shows, etc., theatre, opera, etc., performance fly as supervisors, team leaders, etc., and technical staff as a whole.

Potential future projects

Fire classification for materials used in the entertainment industry.

Power infrastructure

Power distribution within Entertainment Industry. E.g. cabling, connectors, circuit protection

Mediasystems

Mediasystems within Entertainment industry. E.g. control protocols, lighting systems, audio systems, video systems, data connectors and cabling

Liaisons

Liaisons should be established with the following CEN/TC and other organizations for collaboration:

- CEN/TC 10 “Lifts, escalators and moving walks”
- CEN/TC 98 “Lifting platforms”
- CEN/TC 147 “Cranes – Safety”
- European Federation of Materials Handling (FEM)

4.3 Environmental aspects

As every product and every test method has an impact on the environment during all stages of its life-cycle, there is a need to reduce any potential adverse impact by taking into account environmental issues in standards. It is therefore necessary to understand how the product interacts with the environment during its life-cycle, including emissions to air, discharges to water and soil.

CEN/TC 433 should take into consideration:

- the precautionary principle and
- environmental and human health protection and safety aspects

whenever a new standard is drafted or an existing standard is revised or intended to be revised. Furthermore, at any stage in the standard development process, experts are encouraged to include environmental issues in their comments.

Standards should include processes, practices, techniques, materials and products to avoid, reduce or at least control the creation, emission or discharge of any type of pollutant, or waste, in order to reduce adverse environmental impact.
For example, hazardous, toxic or otherwise harmful substances and materials prescribed in standards should be substituted by other less harmful substances and materials, whenever possible and feasible.

Developing standards the precautionary principle will be taken into account by focusing on options and solutions rather than on risk.

The integration of environmental aspects into product development can also be considered involving material reuse, recycling and recovery at end-of-life. Especially aspects related to the use of machinery with internal combustion engines in indoor enclosures will be considered.

CEN/TC 433 should develop robust and properly validated standards, while recognizing the limitations of existing scientific capacity and knowledge to identify potential impacts. In order to take account of the diversity of products and their specific environmental impacts, as well as the need for relevant environmental knowledge, CEN/TC 433 should try to make every reasonable effort to invite environmental experts to participate in the work.

5 FACTORS AFFECTING COMPLETION AND IMPLEMENTATION OF THE CEN/TC WORK PROGRAMME

Due to different existing national standards, finding quick consensus may be difficult and a longer period for discussion might be necessary.