BUSINESS PLAN

CEN/TC 340
ANTI-SEISMIC DEVICES

EXECUTIVE SUMMARY

Business Environment

• Europe represents a large market for anti-seismic devices

• A wide part of the world market is presently concentrated also in China and Japan and the trend shows a substantial increase in these countries at least for the next two decades

• About the sectors of application, a good majority is covered by infrastructures, mainly road and railway bridges. The balance is represented by civil & industrial buildings, as well as industrial plants. The main parties involved are:
- Public administrations owning infrastructures
- Private concessionaires of infrastructures
- Private owners of large buildings
- Private owners of industrial plants

Benefits

Benefits will derive from the achievement of the following tasks, namely:

• improvement of the anti-seismic hardware quality level

• unification of technical requirements among the different European Countries

• creation of a high quality Standard to be adopted in international tenders worldwide alternatively to other well known standards like AASHTO or to local standards

• promotion of European manufacturers technology, with the aim of favouring their export outside Europe

Priorities

Priorities are linked to the need of publicizing the Standard among the potential users, such as designers, governmental bodies, agencies, local authorities, councils, private and public corporations etc.

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.

The protection of transport infrastructure, industrial plants and strategic buildings from earthquake damage represents a key and strategic issue, particularly to southern areas of the European Union.

Moreover, dissemination of modern techniques of seismic protection is increasingly important to builders and equipment manufacturers in most European countries as at least some degree of earthquake protection is likely to be stipulated more widely.

The risk of major economic consequences deriving from environmental hazards and extreme events following damage to chemical plants needs to be minimised.

In earthquake-prone areas in other parts of the developed world, it is recognised that the development of Standards on Seismic Engineering provides the best way to improve the protection of structures and their contents.

For instance, California, China, Japan and New Zealand are actively engaged in the development of novel techniques and devices, and there is a risk that without a corresponding development effort in Europe, companies based overseas will penetrate the European market.

<u>The state of the art in the field addressed by the scope of the CEN committee</u>

During the last 30 years earthquake engineering has made a significant progress.

Modern seismic design strategies, such as Seismic Isolation and Energy Dissipation, have been devised and implemented entailing the use of special mechanical devices to be included in the structure to substantially change its overall behaviour under a seismic attack.

Consequently, said design strategies could not have found useful application without a parallel development of the hardware needed to implement them.

Thus, many research laboratories and certain pioneering, specialized industrial concerns have decided to invest important resources in this field, inventing or improving a series of devices.

The document, which first established - amongst other things - rules on the dimensioning and the use of anti-seismic devices appeared in 1991, more precisely the AASHTO *Guide Specification for Seismic Isolation Design*.

The Technical Committee CEN/TC 340: *Anti-seismic Devices* was created in 1993 (formerly as CEN/TC 167/SC 1), with the mission of standardizing the seismic hardware for use in structures built in seismic areas and designed in accordance with Eurocode 8: *Design of Structures for Earthquake Resistance*.

Today, the European Standard on Anti-seismic Devices represents the most complete and up-todate document in this field presently available to Seismic Engineers practitioners and Seismic Hardware Manufacturers.

In effect, this Standard aims to cover all types of Seismic Hardware in existence and leaves a door open to future progress.

This derives mainly from the fact that the Standard is highly performance-oriented and this feature also constitutes per se a guarantee of equity between the various systems that may be used as alternatives.

Recent or expected technological changes and major innovations related to the industry sector, products or materials addressed by the scope of the CEN committee

Meaningful innovations in the field of seismic hardware occurred in the last 30 years.

Nonetheless, a certain degree of innovation is also expected in the future.

An inducement to invest in innovation in seismic engineering derives from several factors:
- the surging seismic engineering market
- the expiration of international industrial patents on important types of devices, which are improvable and actually need perfecting to meet the high modern demanding requirements
- the need for new high-performance, durable and reliable materials

Recent or expected changes and major innovations in the disciplines or practices addressed by the scope of the CEN committee

A dramatic development in the disciplines (intended as design strategies) or practices addressed by this Standard already occurred during the last forty years.

Categories of relevant stakeholders

The major stakeholders are represented by the following categories:
- Public administrations owning infrastructures
- Private concessionaires of infrastructures
- Agencies
- Local authorities

The minor stakeholders are represented by:
- Private owners of large buildings
- Private owners of industrial plants
- Contractors
- Private and public corporations
- Designers, etc.

The concerns and perceptions of relevant stakeholders

A Standard, given its nature, is in principle a document that limits the user's freedom such as contractors, manufacturers and design engineers.

Therefore, the “minor stakeholders” may potentially display concerns and develop a negative approach.

So as to avoid such an eventuality, the Standard has been drafted in accordance with the following three important rules:
a) requirements are expressed in terms of performance as much as possible;
b) only those characteristics that can be verified by scientific method are included in the Standard;
c) the Standard is so conceived that it represents an objective state-of-the-art and thus does not exclude any system whose validity has been proven through successful applications.

The main concerns of the owners (both private and public) relates to the need for maintenance as well as the devices useful service life.

The Standard addresses these subjects and favours the development of new materials with enhanced performance and durability.

Social, safety, health, environmental or cultural issues related to the industry sector, products, materials, disciplines or practices addressed by the scope of the CEN committee

The European social and economical cohesion benefits from this Standard due to the technological co-operation of the experts from EEA, and allows for an upgrading in the technical level of materials and devices used for the anti-seismic devices.

Furthermore, the exchange of know-how on vibration control technologies between northern and southern European countries, enhances the environmental consciousness in the countries receiving these technologies described in the Standard.

The anti-seismic devices enable construction in high seismicity areas, including those densely populated, thus allowing their industrial growth (e.g. large plants dealing with hazardous material and growing damage potential).

Other relevant international, regional or national standards or voluntary initiatives

The most important Standard in the field is the AASHTO *Guide Specification for Seismic Isolation Design* to which many important projects worldwide make reference.

This Standard represents a valid alternative and is becoming more and more utilized also outside Europe.

National Standards of countries outside EEA normally have local influence for national tenders only.

Real or potential technical barriers to trade related to the scope of the CEN committee, due to diverging national, regional or other standards and/or technical regulations. If possible, an estimation of their financial impact on trade should be provided

In some European countries there is a trend to re-establish “technological barriers” by enforcing additional requirements and procedures for the approval of the imported products.

Very little can be done at normative level, except regularly updating the Standard to the latest technological innovations, so as to avoid alleged reasons of inadequacy or backwardness pleaded by said countries.

The extent of existing or pending patents related to the industry sector addressed by the scope of the CEN committee

As already stated, at present there are no major patents pending in the framework of seismic hardware.

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:

Total international trade in the industry sector/products/materials (in €) over the last 3 years

N.A.

Imports and exports in the industry sector/products/materials (in €) by major geographical regions and/or by countries over the last 3 years

Import is not really remarkable even if growing. Export may be estimated well below half of the total volume and mainly from Italy, Germany and France

Total European trade in new industry sector/product/material growth areas (in €) over the past three years

N.A.

Estimated number of companies (European-wide) operating in the industry sector or producing the products/materials over the past three years

At present there are 5 European industrial Companies involved in the sector of seismic hardware.

Estimated employment (European-wide) in the industry sector over the last 3 years

N.A.

Estimated percentage of products in the marketplace self-declared or certified to the CEN committee's European Standards over the past 3 years

EN 15129 is presently a harmonized standard and addressed products shall be CE marked to be installed.

Indication of cases where organizations (European-wide) require compliance with the CEN committee's European Standards by suppliers, contractors and other service providers

The Standard on Anti-seismic Devices is a harmonized standard. Compliance with is presently compulsory in all Member States.

Indication of cases of governmental adoption of the CEN committee's European Standards into legislation, regulations or procurement requirements

The Standard is a harmonized European product standard.

Indication of cases where CEN committee's European Standards are cited as normative references in European Standards of own and other CEN committees

The Standard on Anti-seismic Devices is cited in the normative reference and in the body of EN 1998 (Eurocode 8) on design of structures for earthquake resistance.

2 BENEFITS EXPECTED FROM THE WORK OF THE CEN/TC

The Standard provides new chances for an industrially profitable production of more efficient, more reliable and more environmentally adapted materials and devices, thus aiding the promotion of an effective European Policy, to the benefit of consumers and industry.

The availability of effective and reliable anti-seismic devices, like those specified in the Standard, as well as the methods of reliable evaluations of their technical and economical benefits will open large markets to the European manufacturers and the construction industry in the sectors of both civil and industrial structures.

Finally, the Standard on Anti-seismic Devices will contribute to increased co-operation amongst various types of companies such as end-users, manufacturers of equipment, construction companies and fabricators of anti-seismic devices - which need to be directly involved for the improvement in seismic resistance of structures or equipment.

Respond to or are expected to respond to recent changes and major innovations in the field addressed by the scope of the CEN committee

CEN/TC 340 within its WG 5 *Revision of EN 15129* is currently preparing the revision this harmonized product standard.

Potential economical benefits for a more sustainable approach to Constructions
Since buildings and structures will be subjected to much lower seismic loads when using the modern anti-seismic devices specified in the Standard, a significantly simpler design and the use of less building material will be possible and demolition, recycling, dumping of debris and reconstruction will be avoided in case of an earthquake attack.

Altogether this should result in lower construction costs, considerable energy saving and buildings and structures which will retain full functionality / operability during and after earthquake attacks.

Well ruled and open European market

This target will be achieved introducing in the Standard all the necessary improvements to prevent some European or extra-European countries from enforcing additional requirements for the approval of the products.

However, as already illustrated, the problem cannot be solved at the Standard level, but is a political issue.

Potential improved consideration with reference to social, safety, health or environmental issues with reference to a more sustainable development

While many conventional structures would be severely damaged in strong earthquakes, those provided with the modern seismic hardware subject of this Standard would suffer no significant damage if correctly designed. This possibility will result in:

a) much greater safety in the event of an earthquake
b) less damage to the historical environment, since the devices could also be used to retrofit historical buildings or protect historical artefacts

c) avoidance of the need for demolition, recycling, dumping of debris and reconstruction after an earthquake and also reduction in the quantity of building material used to start with, as mentioned in other part of this Business Plan;
d) improved possibility of siting industrial work places, having a reduced seismic risk, close to housing.

The social benefits will consist of:

a) much lower risk, due to significantly reduced probability of damage or failure
b) better emergency management and first aid, due to availability of strategic buildings and infrastructures (if provided with anti-seismic devices)
c) calm of the population and improved quality of life, due to the consciousness of living in seismically safe structures
d) assuring safety by improving the reliability of structures (hospitals, museums, plants, control rooms and etc) located in earthquake prone areas.

Effective support and conformity to European legislations

The present scenario of European legislation on construction products is clearly unsatisfactory particularly because the regulations are disregarded or ignored.

The seismic engineering sector does not make an exception. Particular concern is addressed to the installation of anti-seismic devices without CE marking inside the European market.

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.

At the present state it seems that experts from Austria, France, Germany, Italy, Romania, Spain, Switzerland and UK have been appointed by NSBs to participate in the CEN/TC 340 activities for the revision of EN 15129.

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

4.1 Defined objectives of the CEN/TC

The scope of CEN/TC 340 is the standardisation of anti-seismic devices that are provided in structures like bridges, civil and industrial buildings, industrial plants etc. with the aim of protecting them by modifying their response to the seismic actions.

The relevant Standard gives rules and requirements for design and manufacture of the devices, specifications for materials, as well as criteria for acceptance and testing.

The TC members are also committed themselves with activities that aim at disseminating the knowledge of the Standard through the active participation in scientific/technical events such as Seminars, Symposia, Congresses etc.

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

Prioritisation of projects

Priorities of the work programme are the following in order of priority (Level 1 the higher):

Level 1

1. Amendment of all typos and editorial mstakes;
2. Amendment of the technical mistakes and internal discrepancies;
3. Check of consistency with Eurocodes and Eurocode 8 in particular;
4. Check of consistency with other product standards (i.e. EN 1337).

Level 2

5. Code updating;
6. Reference to sustainability, life cycle and other issues.

Co-operation and liaisons with other CEN committees

In order to ensure the necessary coordination with other related activities, a strong cooperation with CEN/TC 250/SC 8 *Eurocode 8 - Earthquake resistance design of structures,* CEN/TC 167 *Structural Bearing,* ISO/TC 45/SC 4/WG 9 *Elastomeric isolators* and ISO/TC 45/SC 4/WG 14 *Elastomeric bridge bearings,* and GNB SG 16 *Structural bearings* is recommended*.*

Expected deliverables

An updated release of EN 15129 (review) related to points 1 and 2 of “Level 1” is planned within 2016.
A more extensive revision referred to points 3 and 4 of “Level 1”, will be planned immediately after the submission of the next review mentioned before upon a detailed schedule of activity based on a three-year programme starting from the beginning of 2017.
Level 5 and 6 will also be addressed and introduced as a medium term goal.

Any specific special/innovative structure and/or way of working in the CEN/TC

No specific special structure and/or way of working is foreseen at the moment.

4.3 Environmental aspects and Sustainability

CEN/TC 340 is committed to consider environmental aspects and all issues referred to Sutainability during the annual plenary meetings and draws the attention of its WG 5 on how to address these issues within their field and responsibility.

Maximum commitment will be undertaken by the TC in taking care on environmental aspects and Sustainability using the tools provided by CEN (Guide 4, Environmental Checklist, CEN/EHD etc.).

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

Having considered what stated in the sections above, and in order not to loose reliability, it is essential that the work is carried out in an acceptable period of time in order to meet the timing an goals of the world of Industry.