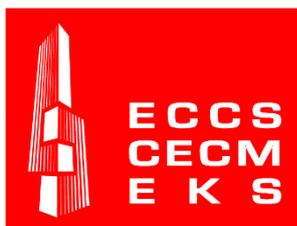




**HISTORY AND ACHIEVEMENTS  
1955-2015**

**THE EUROPEAN CONVENTION FOR  
CONSTRUCTIONAL STEELWORK**

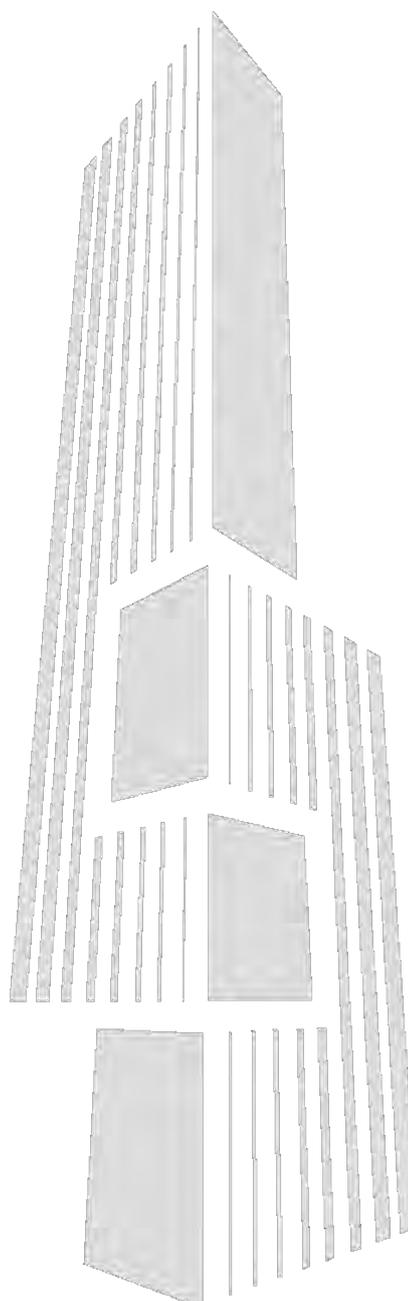




European Convention for Constructional Steelwork  
Convention Européenne de la Construction Métallique  
Europäische Konvention für Stahlbau

# The European Convention for Constructional Steelwork

## History and Achievements 1955 – 2015



N°137 | 2015

## **The European Convention for Constructional Steelwork History and Achievements 1995 - 2015**

**N°137**

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## Notations

AC	Advisory Committee
CECA	Communauté Européenne du Charbon et de l'Acier
CECM	Convention Européenne de la Construction Métallique
ECCS	European Convention for Constructional Steelwork
EKS	Europäische Konvention für Stahlbau
ESSPG	European Structural Steel Promotional Group
IPO	Independent Promotion Organisation ( <i>IPO Steelnetwork is a network of organisations who are in charge of the promotion of steel in the construction sector in order to reach a larger and more effective use of steel</i> )
MDTB	Market Development and Technical Board
PMB	Promotion Management Board
TC	Technical Committee
TMB	Technical Management Board



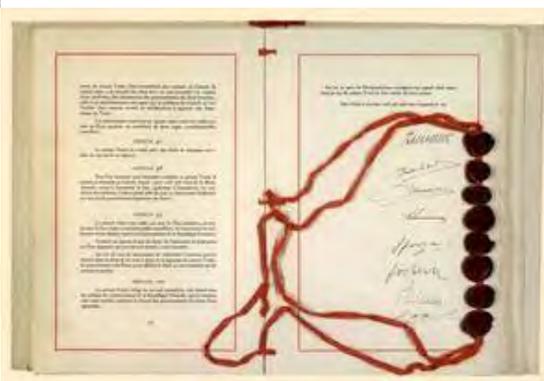
## 1 Origin of the European Convention

To understand the objectives of the Convention as defined at its inauguration in 1955 and to gauge the success which it has achieved in over sixty years, it is necessary to recall the conditions which prevailed in many European countries at the end of the Second World War. In the reconstruction programmes priority was given to the erection of such structures as steelworks, power stations and long span bridges, where only steel could be used. But steel was so scarce that most governments decreed that where other materials, such as reinforced concrete, were more readily available, they were to be employed in the construction of housing and office blocks, as well as small span bridges. In consequence, when steel became more plentiful, it was found that the new generations of architects and structural engineers had very little experience in the design and erection of structural steelwork, and the cement and concrete industries had taken the opportunity to impose themselves. What was more, of course, the cement and concrete industries, especially through research and international collaboration, were constantly improving design and construction techniques, particularly in the comparatively new field of prestressed concrete. It was with this unpromising background and on the basis that unity is strength, that the Convention was created to redress the balance towards structural steelwork.

The European Convention for Constructional Steelwork was inaugurated as the result of some informal discussions in Zürich and Paris which took place as early as 1953 among the Presidents, a few senior members and the Directors of the “Verban Schweizerischer Brückenbau – und Stahlhochbau – Unternehmungen (VSB)”, the “Syndicat de la Construction Métallique de France (SCMF)” and the “Deutscher Stahlbau-Verband (DSTV)”; it was in parallel with the creation of the ECSC - *European Coal and Steel Community* (Figure 1).



*Signature of the Treaty establishing the ECSC in the Salon de l'Horloge (Quai d'Orsay) where Robert Schuman, French Foreign Minister, holds the Treaty*



*Treaty of ECSC*

**Figure 1: Establishment of the ECSC (European Coal and Steel Community)**

The ECCS was inaugurated on 17<sup>th</sup> October 1955 in Zürich by the signature of the original Agreement between Austria, Belgium, France, Germany, Italy, The Netherlands, Spain and Switzerland. The participants then proceeded to set up the first study groups, which appeared to represent the most important questions of general interest which needed to be examined.

The Agreement was quite a remarkable document. It was very brief and succinct but, with amazing foresight, it encapsulated all the objects and functions required. When the official seat of the Convention was transferred from Zürich to Rotterdam in 1969, however, this Agreement had to be replaced by a much lengthier legal document entitled Articles of Constitution. This has been amended from time to time, the last edition having been approved at the Annual General Meeting in Lisbon in 2012 (Figure 2).



**Figure 2: ECCS Annual General Meeting in Lisbon, Portugal, 2012**

When United Kingdom joined the Convention in 1958, the three European languages English, French and German were used for every communication, but translations being time-consuming and notoriously expensive, in 1978, it was decided that all future Annual Meetings would be conducted in English and this has been maintained until now.

The Convention became the ideal platform for the promotion and research of the European Constructional Steelwork industry and paved the way of the present-day codes and standards through the creation of Technical Committees of experts, fathers of the so called European Recommendations.

## 2 The aims of the Convention

Sixty years afterwards, the Convention still identifies the international promotion of the constructional steelwork industry as its main purpose. Certainly the objectives cover in the first instance the wide field of steel framed buildings of all kinds and related structures inclusive steel sheet cladding and roofing, then of course bridges and transmission towers (Figure 3); other constructions for industrial purposes are considered as far as the member associations and their member companies are interested in such related applications of structural steelwork. In 2015, a new technical committee (TC16) began about steel support structures of wind energy converters.



*Office Building KPMG, Luxembourg, 2015, FEDIL STEELCONSTRUCTION (ECCS Steel Design Award 2015)*



*Ravine Fontaine viaduct, Reunion Island, France, 2009, nissou-architectes.fr (ECCS Bridge Award 2010)*

**Figure 3: Steel construction**

Despite their close relationship to the traditional structural steelwork industry, also regarding design rules, off shore constructions have, up to now, not been immediately mentioned in the development work of the Convention, although some important steel fabricators belonging to member associations are very active in these fields.

Finally, the role of the Association is:

- To facilitate contacts between industrialists and opinion leaders of the industry;
- To follow the economic development of the constructional steelwork industry in Europe and overseas;
- To promote the use of steel in construction and the capabilities of steel fabricators (Figure 4a);
- To provide a networking platform, meetings and events to discuss matters of common interest;
- To sit on numerous committees concerned with regulations, Eurocodes and their implementation to look after the steel fabricators interests;
- To provide members with technical information through publications and website;
- To organize seminars, workshops and national or international symposium on steel construction related matters (Figure 4b);
- To represent steel fabricators' interests in professional institutions, government or European bodies, associations or technical groups;

- To disseminate more than 130 technical, promotional and generic publications (catalogue on the ECCS website [www.steelconstruct.com](http://www.steelconstruct.com) - Figure 4c);
- To support the promotional efforts of the member associations by exchange of experience in their promotion work, publication of promotional texts and marketing arguments to be used in the national promotion campaigns, international symposia for engineers and architects, public relations for constructional steelwork.



a) ECCS Brochure “Merits of Steel Construction”, 1998



b) ECCS Open workshop, Paris, April 2015



c) Publications

**Figure 4: Overview of some activities of the Association**

## 3 The structure of the Convention

### 3.1 Members

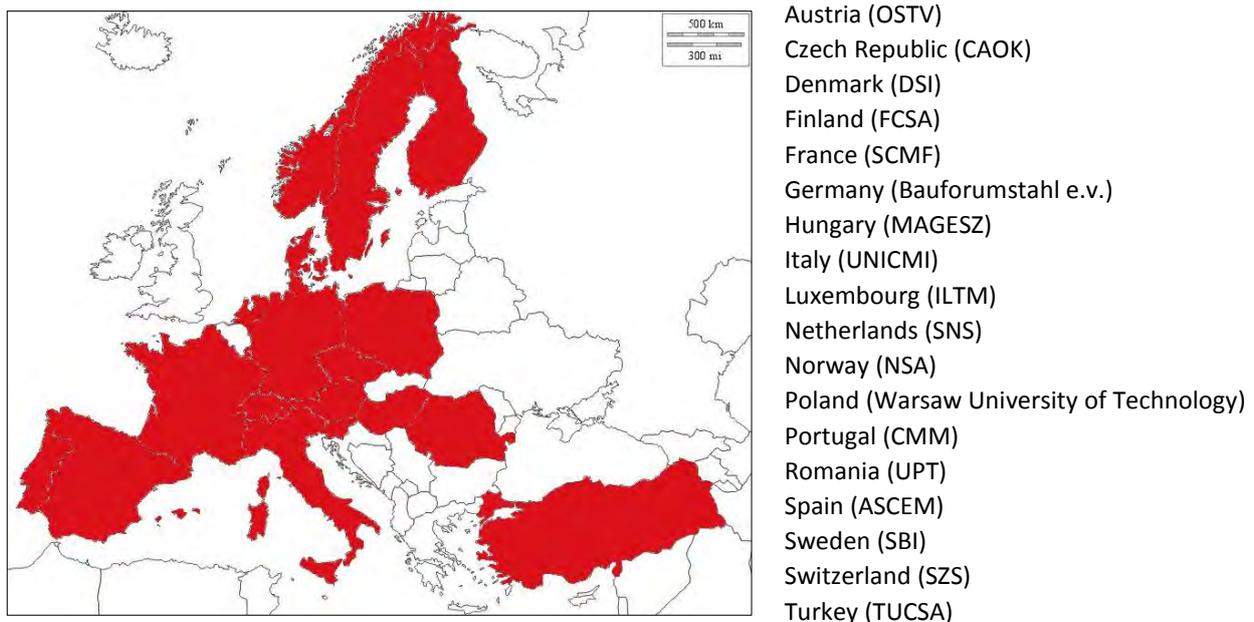
#### 3.1.1 ECCS membership

ECCS includes associations from European countries as Full Members, non-European associations as International Members, professional international organisations as Associate Members, representatives of upstream or downstream products or activities as Supporting Members, and worldwide companies interested in Steel Construction as Company members (see Figure 5). Individual membership is open worldwide to all architects, engineers or anyone interested in steel construction subjects and in supporting the ECCS's objectives



**Figure 5: ECCS Members**

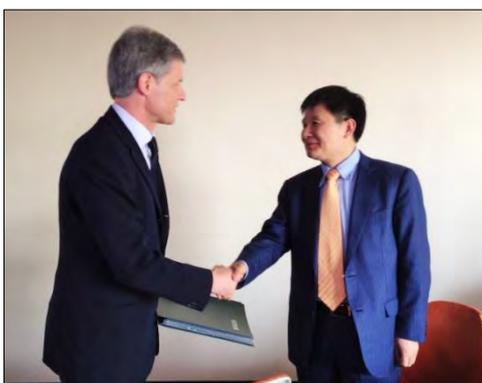
European national associations active in the field of steel construction can become full members of the Association. In 2015, ECCS has 18 full members (see Figure 6).



**Figure 6: ECCS Full Members in 2015**

Since 1967, non-European national associations are admitted as International members. Japan, Korea, USA, Australia and Canada associations joined the Convention for a while. In 2015, ECCS and the American Institute for Steel construction AISC have maintained the tradition of workshops on connections every three years.

A memorandum of agreement was signed in Paris, on 23<sup>rd</sup> April 2015, with the China Steel Construction Society CSCS (see Figure 7), in order to deepen and to promote the mutual-understanding and interchange between European and Chinese standards for the design of steel structures, to disseminate publications and to mutually promote activities.



*On the left: Ernest Hendrickx, ECCS Chairman of the Board;*

*On the right: Guo-Qiang Li, Professor at Tongji University and representing CSCS*

**Figure 7: Signature of the Memorandum of Agreement, Paris, 23<sup>rd</sup> April 2015.**

### 3.1.2 Evolution of membership along the years

During the first ten years of the Convention, only European members were accepted. Then in 1967, International members were admitted as Associate members (see Table 1). At the beginning of the twenty-first century, the member's categories were re-defined and new ones were created: Associations from outside Europe have been categorized as International members, and new associate members have been admitted (such as technical institutions or IPO).

**Table 1: Evolution of membership along the years**

	1955	1988	1995	2005	2015
<b>Full Members</b>	<b>8</b> (AT, BE, FR, DE, IT, NL, SP, CH)	<b>14</b> (AT, BE, CH, FI, FR, DE, DK, IT, LU, NL, NO, SW, UK, Yugoslavia)	<b>18</b> (AT, BE, CH, TR, CZ, FI, FR, HR, DE, DK, GR, IT, LU, NL, NO, SP, SW, , UK)	<b>22</b> (AT, BE, CH, CZ, EST, FI, FR, DE, DK, HU, IT, LU, NL, NO, PT, RO, SK, SL, SP, SW, TR, UK)	<b>18</b> (AT, CH, CZ, DE, FI, FR, DE, HU, IT, LU, NL, NO, PL, PT, RO, SP, SW, TR)
<b>International Members</b>	-	-	-	<b>3</b> (Japan, Korea, USA)	<b>0</b>
<b>Associate Members</b>	-	<b>3</b> (Canada, Japan USA)	<b>3</b> (Canada, Japan USA)	<b>5</b> (CIA, OTUA, APTA, CIDECT, CORUS)	<b>5</b> (Infosteel, CTICM, CIDECT, Tata Steel, Construiracier)
<b>Supporting Members</b>	-	-	<b>1</b> (ESSPG)	<b>2</b> (ESSPG, Marcegaglia)	<b>4</b> (AM LU, Tata Steel, Dillinger, EGGA)

## 3.2 Organs of Government

The organization of the Convention was defined in order to manage the numerous members and the increasing complexity of the tasks it had to fulfil in the common interest of the European Constructional Steelwork industry.

Along the years, the structure of the committee has evolved, but the main structure was defined since 1981 without big changes. In 2015, the Convention has the following structure:

- The Annual General Assembly,
- The Executive Board,
- The Management Working Group,
- The Joint Commission
- The General Secretariat (located in Brussels since 1978)
- The Technical Management Board (TMB), with Technical Committees (TC)
- The Promotion Management Board (PMB), with Advisory Committees (AC)

The ECCS Quality Manual covers all activities of ECCS and defines and details all procedures in accordance with the mission and organization of ECCS as defined in the Articles of Association, which can be found on the ECCS webpage ([www.steelconstruct.com](http://www.steelconstruct.com)).

### 3.2.1 Annual General Assembly

The General Assembly is the sovereign authority of the Association and is convened by the Secretary General on behalf of the Executive Board when requested by the law or the statutes and every time when requested by the objects or interests of the Association. The General Assembly meets at least once a year between September, 1<sup>st</sup>, and December, 1<sup>st</sup>, for the approval of the accounts, the budget and the discharge of the Board members and the auditor (Figure 8).



*Brussels, Belgium, 1996*



*Istanbul, Turkey, 2015*

**Figure 8: Some ECCS Annual General Meetings**

The ECCS Presidency is renewed every year upon invitation of the hosting country, and the medal is handed over from President to President every year since 1989 (Figure 9). A complete list of chairmen and venues for all the Annual General Assemblies in the last thirty-three years is given in Appendix A.1. These annual conferences and congresses, allow the representatives of the different countries, the members of the Convention's official bodies and the chairmen of the Committees, to exchange their views. The success of international collaboration depends very much on mutual understanding and friendship among the opinion leaders of the different member associations.



**Figure 9: ECCS Medal of the President**

### **3.2.2 Executive board**

The Executive Board of ECCS is the main governance body made of the representatives of the National Associations (NAMs). It gives guidance to the Promotional and Technical Management Boards, monitoring the work of the Committees.

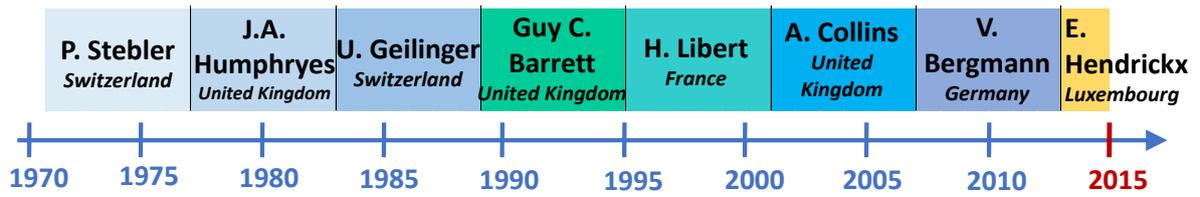
Initially the nominal chief executive officer of the Convention was the President who changed every year. The day-to-day operations of course were run by the General Secretaries. In order to improve operational control and executive continuity, an Executive Board of seven members was installed in 1971.

Nowadays, the Executive Board elects a Chairman from among its members to serve for a period of three years, renewable once. The chairman is responsible for the current operations of the Association together with the General Secretary, the Chairmen of the TMB/PMB and the president of the year. Figure 10 depicts the eight chairmen of the Executive Board, since its inception.

The Executive Board consists of:

- A minimum of 5 representatives of Full members (NAM – National Association Members), duly appointed by the latter and a maximum of 4/5 of representatives of the total full members.
- The President of the Association ex officio on behalf of the Association.
- The General Secretary of the Association ex officio to maintain continuity in the Executive Board's activity and for assisting at fulfilling the duties of the Executive Board.

All the operation rules of the Executive Board are detailed in the Quality Manual.



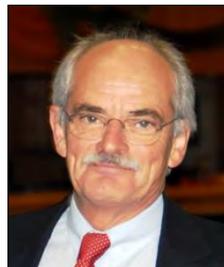
**Guy C. Barrett**  
*United Kingdom*  
1989-1995



**Hervé Libert**  
*France*  
1995-2001



**Allan Collins**  
*United Kingdom*  
2001-2007



**Volkmar Bergmann**  
*Germany*  
2007-2013



**Ernest Hendrickx**  
*Luxembourg*  
2013-...

**Figure 10: Executive board Chairmen**

### 3.2.3 The Management Working Group

The Management Working Group (MWG) is an Executive Committee that was created in 2006, in order to fasten decisions which needed quick reaction and speed the management of matters that are known to be too long and heavy in ECCS. A small group of management is composed of 6-7 persons:

- ECCS President
- EB chairman and vice-chair
- PMB and TMB chairmen and vice-chairs
- The secretary General
- Any Full member who wishes to take part.

The MWG manages ECCS assuming the responsibilities of the EB in between EB Meetings and meets 3 to 4 times per year. The MWG reports to the Executive Board.

### 3.2.4 The Joint Commission

A joint commission was created at the beginning of the ninetieth. The Joint Commission gives the guidelines for the projects sponsored by the Supporting members. The Joint Commission ensures that the promotional, technical and advisory committees are encouraged to submit projects and apply for financial support. The Joint Commission comments on submitted projects and allocates the funds, taking into account the priorities given to the funding by the Supporting members. The Joint Commission reports to the Executive Board.

The Joint Commission consists of:

- members representing the Full members
- members representing the Supporting members
- members representing the Associate members
- the ex officio Secretary General

### 3.2.5 The Management Boards

Until 1981 the Technical General Secretary was the main initiator and coordinator of the research and development activities of the Convention. In order to alleviate the onerous tasks upon the General Secretariat, a Technical Board was nominated in that year, under the inspiring leadership of Professor E.J. Thrane from Norway. In 1984 the Board was charged to supervise not only the technical research but also to promote the market development of the structural steelwork industry. This Market Development and Technical Board (MDTB) was created (see Figure 11) and two chairmen succeeded: K. Huber, Switzerland (1987-1994), and Dir. Dipl. Ing. M. Roller, Austria (1995-2001).

The special duty of the MDTB was to guide and coordinate the policy and activities of the Technical and Market sector Committees of the Convention. Therefore the MDTB had to ensure that committee work was done in an efficient way to the benefit of structural steelwork. The board had also, together with the General Secretary, to plan and to supervise all Convention publications. Originally, it was a tradition to translate all the publications issued into three languages (French, English and German). From 1985 on, it was decided to harmonize cover pages and English was chosen as the sole language for technical documents in ECCS.

In 2000, because of the huge increase of technical and promotional activities, the MDTB was divided into a Technical Management Board (TMB) and a Promotional Management Board (PMB).

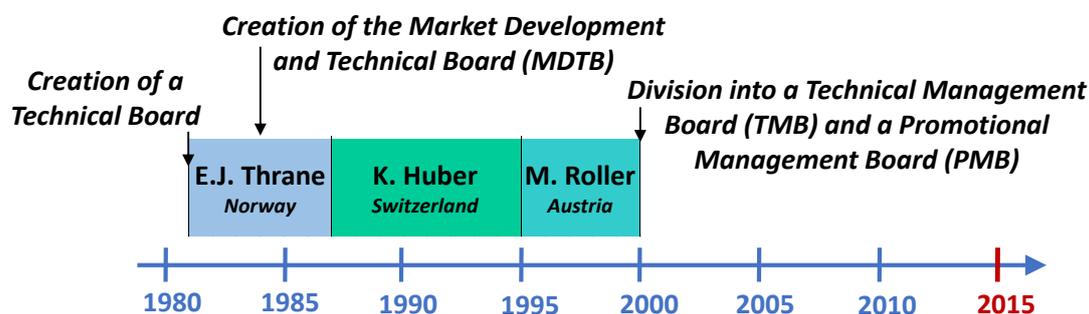


Figure 11: Chairmen of the MDTB – *Market Development and Technical Board*

Nowadays, the Management Boards lay down, guide, coordinate and manage the policy and activities of the technical and any other advisory committees and sub-committees of the Association. It ensures that the activities of the committees and sub-committees are proficient to the benefit of the steel construction industry.

The Technical and Promotion Management Boards consist each of:

- maximum one delegate per Full Member
- the ex officio Secretary General and Chairman of the Executive Board
- the Associate Members may delegate two members
- the International Members may delegate two members
- the Supporting Members may delegate two members

#### 3.2.5.1 *Technical Management Board*

The Technical Management Board (TMB) is the expert forum that i) establishes consensus on European practice and provides the undisputed background for normalization; ii) identifies ongoing developments in specific fields; and iii) helps establishing priorities for R&DI. Since its creation, TMB has counted with three former chairmen: Mr. Richard Barrett, United Kingdom (2000-2004), Prof. Gerhard Sedlacek, from RWTH Aachen University in Germany (2004-2007), and Prof. Simões da Silva, from University of Coimbra in Portugal (2007-2013). Since 2013, the chairmanship is carried out by Professor Milan Veljkovic, from Delft University of Technology, The Netherlands.



Richard Barrett  
***United Kingdom***  
2000-2004



Gerhard Sedlacek  
***Germany***  
2004-2007



Luís Simões da Silva  
***Portugal***  
2007-2013



Milan Veljkovic  
***The Netherlands***  
2013-...

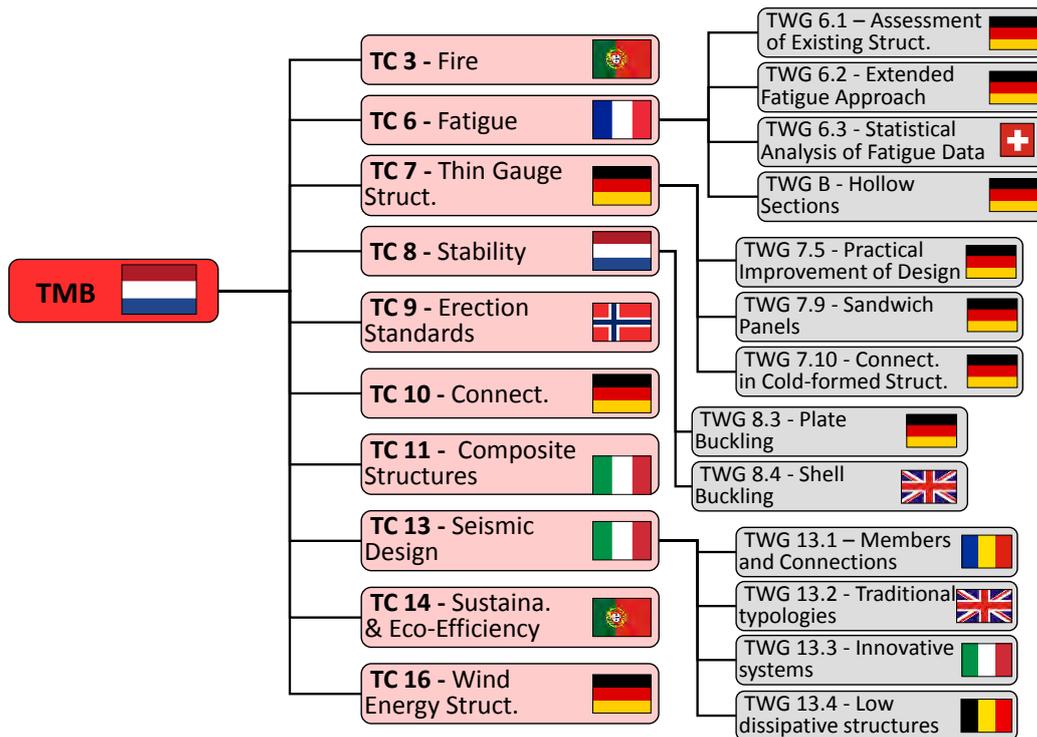
**Figure 12: TMB Chairmen**

The TMB follows up research works in the actual ten Technical Committees (TCs), which comprise over 350 experts. Since the inception of the TMB, several changes have been performed in the organisation of the Technical Committees. Table 2 illustrates these changes and shows all the committees that already have existed under MDTB or PMB. Details of technical advances and work gained since the creation of the Committees are detailed in chapter 4.

**Table 2: Evolution of the Technical Committees (chairmen)**

1955	1988	1995	2005	2015
<b>1.</b> Comparison of European Codes (P. Lorin, FR)	<b>TC1</b> - Structural Safety (G. Ballio, IT)	<b>TC1</b> - Structural Safety (G. Sedlacek, DE)	<b>TC1</b> - Safety and Actions (G. Sedlacek, DE)	<b>TC3</b> - Fire (P. Vila Real, PT)
<b>2.</b> Steel Qualities (W. Wolf, DE)	<b>TC2</b> - Aluminium-Alloy Structures (G. Valtinat, D)	<b>TC2</b> - Aluminium Alloy Structures (G. Valtinat, D)	<b>TC2</b> - Aluminium (To be appointed)	<b>TC6</b> - Fatigue and Fracture (M. Lukić, FR)
<b>3.</b> Fire Protection (C.F. Kollbrunner, CH)	<b>TC3</b> - Fire Safety (Mrs. M. Law, UK)	<b>TC3</b> - Fire (J.P. Favre, CH)	<b>TC3</b> - Fire (P. Schaumann, DE)	<b>TC7</b> - Cold formed Thin Wall Sheet (J. Lange, DE)
<b>4.</b> Corrosion Protection (M. Lourtie, BE)	<b>TC4</b> - Corrosion (C.L. Bijl, NL)	<b>TC5</b> - CAD/CAM (J.B. Schleich, L)	<b>TC6</b> - Fatigue and Fracture (A. Nussbaumer, CH)	<b>TC8</b> - Structural Stability (H. Snijder, NL)
<b>5.</b> Steel sections (R.L. Lauterburg, CH)	<b>TC5</b> - CAD/CAM (J.B. Schleich, L)	<b>TC6</b> - Fatigue (M.A. Hirt, CH)	<b>TC7</b> - Thin Gauge (A.W. Tomà, NL)	<b>TC9</b> - Execution and Quality Management (K. Myhre, NO)
<b>6.</b> Normalization of Sections (J. Dutheil, FR)	<b>TC6</b> - Fatigue (M.A. Hirt, CH)	<b>TC7</b> - Cold Formed Thin Walled Sheet Steel in Building (J.M. Davies, UK)	<b>TC8</b> - Structural Stability (J. Lindner, DE)	<b>TC10</b> - Connections (T. Ummenhofer, DE)
<b>7.</b> Metric Unification (R. Affer, IT)	<b>TC7</b> - Thin-Walled Cold-Formed Sheet Steel (R. Baehre, D)	<b>TC8</b> - Structural Stability (J. Lindner, DE)	<b>TC9</b> - Execution and Steels (R. Pope, UK)	<b>TC11</b> - Composite (R. Zandonini, IT)
	<b>TC8</b> - Structural Stability (D. Vandepitte, BE)	<b>TC9</b> - Manufacturing and Erection Standards (J.S. Allen, UK)	<b>TC10</b> - Connections (F.S.K. Bijlaard, NL)	<b>TC13</b> - Seismic (R. Landolfo, IT)
	<b>TC9</b> - Manufacturing and Erection Standards (T.K. Gibson, UK)	<b>TC10</b> - Structural Connections (J.W.B. Stark, NL)	<b>TC11</b> - Composite (M. Feldmann, DE)	<b>TC14</b> - Sustainability & Eco-efficiency of Steel Construction (L. Bragança, PT)
	<b>TC10</b> - Bolted and Welded Connections (J.W.B. Stark, NL)	<b>TC11</b> - Composite Structures (H. Bode, D)	<b>TC13</b> - Seismic (F. Mazzolani, IT)	<b>TC16</b> - Wind Energy Supporting Structures (P. Schaumann, DE)
	<b>TC11</b> - Composite Structures (H. Bode, D)	<b>TC12</b> - Wind Design (P. Spehl, B)		
	<b>TC14</b> - Quality Assurance and Control (D.S. Trickett, UK)	<b>TC13</b> - Seismic Design (F. Mazzolani, IT)		
		<b>TC14</b> - Quality Assurance & Quality Control (M. Mayrhofer, A)		

The list of the active committees in 2015, with the chairmen nationalities and technical working groups, is depicted in Figure 13.



**Figure 13: Active Technical Committees in 2015**

Since 2008, ECCS is also involved in European projects, mainly for the dissemination work, thanks to its strong dissemination power (National Steel Associations members, organization of international conferences, meetings and consortiums, etc...). These projects are listed in Table 3, and detailed information is available on [www.steelconstruct.com](http://www.steelconstruct.com).

The TMB follows up the publications of Eurocode Design Manuals collection (see Figure 14 and at the e-store on [www.steelconstruct.com](http://www.steelconstruct.com)) and background documents on Eurocodes, in cooperation with the JRC - *Joint Research Centre* of the European Commission.

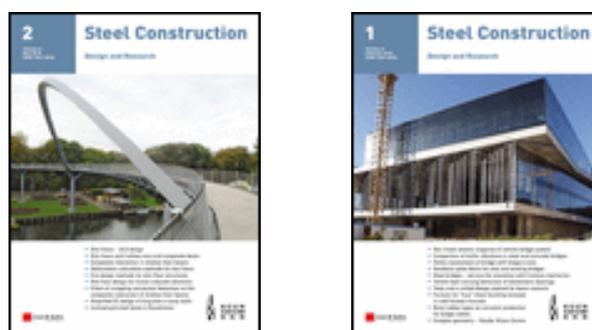


**Figure 14: The Eurocode Design Manuals**

**Table 3: European Projects involving ECCS**

<b>Acronym (Financing Institution)</b>	<b>Complete name</b>	<b>Period</b>
<b>ESE (RFCS)</b>	Economics of steel framed buildings in Europe	July 2008 – June 2010 (24 months)
<b>SteelProst (FP7)</b>	Innovative fire protective coatings for steel structures	May 2010 – October 2012 (30 months)
<b>Semi-comp+ (RFCS)</b>	Valorisation Action of Plastic Member capacity of semi-compact steel sections – a more Economic Design	July 2010 – December 2011 (18 months)
<b>SB_Steel (RFCS)</b>	Sustainable building project in steel	October 2010 – September 2013 (36 months)
<b>Infaso+ (RFCS)</b>	Valorisation of knowledge for innovative fastening solutions between steel and concrete	July 2012 – June 2014 (24 months)
<b>EqualJoints (RFCS)</b>	European pre-qualified steel joints	July 2013 – June 2016 (36 months)
<b>Safebrittle (RFCS)</b>	Standardization of safety assessment procedures across brittle to ductile failure modes	July 2013 – June 2016 (36 months)
<b>Barrier+ (FP7)</b>	One component waterborne barrier coatings	January 2014 – June 2016 (36 months)
<b>Steel-Earth (RFCS)</b>	Steel-based applications in earthquake-prone areas	July 2014 – December 2015 (18 months)
<b>Histwin+ (RFCS)</b>	High-Strength steel tower for wind turbine	July 2014 – December 2015 (18 months)

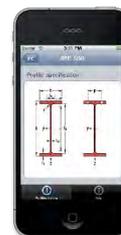
Since 2008, *Steel Construction – Design and Research magazine*, Ernest & Sohn (Wiley Group), is the official journal of the Convention. In this magazine, peer reviewed papers covering the entire field of steel construction research or reports on innovations from the construction industry are published. An internationally renowned Editorial Board assures a highly interesting selection of topics and guarantees the high standard of the contributions. The TMB has an editorial role in the ECCS Journal « STEEL CONSTRUCTION » Design and Research, Ernest & Sohn (Wiley Group), which is a vehicle for dissemination of news and technical developments (Figure 15).

**Figure 15: The Steel Construction Magazine**

ECCS Applications (Apps) for smartphones and tablets are developed (Available for iOS and Android). In 2015, two Apps are freely downloadable on the ECCS web site (see Figure 16), and three new Apps are in development.



The **EC3 Steel Member Calculator** provides a database of hot-rolled profiles and fasteners and calculates the resistance of hot-rolled steel columns and beams (subject to major axis bending) according to EC3-1-1.



The **Buildings LCA Calculator** calculates the environmental performance of buildings according to EN 15804 (system level) and components according to EN 15978 (material level).



The **EC3 Steel Connections Calculator** provides a database of fasteners and welding products, and beam-to-column end-plate joints, and calculates the resistance of structural bolts and welds.



The **EC3 Plated Steel Members Calculator** provides a database, general definition of arbitrary mono-symmetric built-up I-sections and box-sections, and design verifications of plated members  
*(In development)*



The **EC3 Cold-formed Steel Calculator** provides a database, member verifications, and cross section typologies.  
*(In development)*

**Figure 16: The ECCS Apps**

Some databases are available on ECCS webpage, within the “Projects” tab:

#### **DATABASE OF CERTIFIED COMPANIES**

The database of Certified Companies collects information on companies with respect to Quality Management Systems (ISO 9001), Environmental Management Systems (ISO 14001), CE Marking (EN ISO 1090-1) and Welding Quality Management (EN ISO 3834).

#### **DATABASE OF ENVIRONMENTAL DECLARATION OF PRODUCTS (EPDs)**

The Database of Environmental Declaration of Products (EPDs) allows to evaluate the Life Cycle Assessment (LCA) of the products or services, reporting data and measuring some indicators related with air, soil and water emissions on the production process.

#### **DATABASE OF STEEL PROPERTIES**

The database of steel properties, in line with the RFCS project Safebricktile (Figure 17), allows to saving in R&D projects and to achieve consistent safety level in the design rules throughout all parts of EC3.



**Towards the Eurocodes Era**

The EN Eurocodes are a set of European standards which provide common rules for the design of construction works, to check their strength and stability against live extreme loads such as fire and earthquakes. After the publication of the set of 58 Eurocodes Parts in 2007, the implementation of the Eurocodes is taking place in all EU and EFTA Member States and there are firm steps toward their adoption internationally.

The European Commission contributes towards consistency in the adoption and use of the Eurocodes in the Member States and to facilitate training and awareness campaigns. The website "Eurocodes: Building the future" <http://eurocodes.jrc.ec.europa.eu> serves as a platform for the collection, exchange and dissemination of training and promotional material and information.

In the framework of the project "Support to the implementation and further development of the Eurocodes" the JRC, together with DG Enterprise and Industry, established a strategy and a general programme to foster the awareness and training on the Eurocodes, including the organisation of workshops with emphasis on worked examples and the publication of reports compiling the technical papers and the practical examples prepared by the lecturers of the workshops.

**Objectives**

The Workshop "Design of steel buildings with the Eurocodes", with emphasis on worked examples, intends to contribute towards the transfer of background knowledge and expertise on the Eurocodes, mainly the EN 1993, from specialists of the European Convention for Constructional Steelwork (ECCS) to potential trainers and Eurocodes users.

The principal objectives of the Workshop are:

- transferring knowledge and information on the Eurocodes to trainers and users, namely representatives of key organisations, institutions, industry and technical associations;
- providing state-of-the-art training material, background information and worked examples to trainers and users of the Eurocodes;
- facilitating exchange of views, networking and cooperation.

**Preliminary Programme**

The Workshop will commence in the morning of October 16 and conclude in the afternoon of October 17. The Workshop will include presentations mainly on the EN 1993 general rules, basic design principles and design methods, and relevant worked examples. Specific rules for fire and earthquake resistance of steel buildings, and sustainability aspects relevant for designers will also be presented. The Workshop sessions will address:

- General rules and rules for buildings (Part 1-1 of EN 1993);
- General rules for structural fire design (Part 1-2 of EN 1993);
- Supplementary rules for cold-formed members and sheeting (Part 1-3 of EN 1993);
- Design of joints (Part 1-8 of EN 1993);
- Specific rules for the design of steel buildings for earthquake resistance (Part 1-1 of EN 1998);
- Sustainability aspects (several Parts of EN 1993 and other sources).

**Training delivered by**

Luís Simões da Silva University of Coimbra, Portugal, Director of the Institute for Sustainability and Innovation in Structural Engineering, President the Portuguese Steelwork Association.

Rui Simões University of Coimbra, Portugal.

František Wald Czech Technical University in Prague, Czech Republic.

Jean-Pierre Jaspart University of Liege, Belgium.

Dan Dubina Politehnica University of Timisoara, Romania, Chairman of the Romanian Association for Constructional Steelwork (APCMR).

Raffaele Landolfi University of Naples "Federico II, Italy, Actual president of the European Convention for Constructional Steelwork, ECCS.

Paulo Vila Real University of Aveiro, Portugal, Head of the Fire Resistance Laboratory of the University of Aveiro.

Milan Vejtkovic Luleå University of Technology, Sweden, Chairman of the Technical Management Board of ECCS.

Helena Gervásio University of Coimbra, Portugal, Secretary of the Portuguese Technical Committee on the Sustainability of construction works.

**Thursday, October 16**

9:00 – 9:30	Registration
9:30 – 10:00	Welcome address and introduction A. Pinto, DG JRC, European Commission M. Rogalska, DG Enterprise and Industry S. Denton, Chairman CEN/TC250 The present and future of the Eurocodes S. Denton, Chairman CEN/TC250
10:00 – 10:15	Coffee break
10:15 – 10:30	Overview of EN 1993 J. Kulhmann, Chairman CEN/TC250/SC3
10:30 – 11:00	Coffee break
11:00 – 12:15	Basics of design, a case study building L. Simões da Silva
12:15 – 13:45	Lunch break
13:45 – 15:00	Member design R. Simões Bolts, welds, column base F. Wald
15:00 – 16:15	Coffee break
16:15 – 18:45	Design of structural steel joints J.-P. Jaspart

**Friday, October 17**

9:00 – 9:30	Registration
9:30 – 10:45	Cold formed steel design D. Dubina
10:45 – 11:15	Coffee break
11:15 – 12:30	Seismic design of steel structures R. Landolfi
12:30 – 14:00	Lunch break
14:00 – 15:15	EN 1993-1-2 - Resistance of members and connections to fire P. Vila Real
15:15 – 15:45	Coffee break
15:45 – 17:00	Sustainability aspects: inventory, comparisons M. Vejtkovic, H. Gervásio Conclusions and closure
17:00 – 17:30	DG JRC, European Commission

\*There will be a dedicated part (15 min.) on "Discussion and Questions" in the end of each lecture.

Figure 19: JRC/ECCS training course on Design of Steel Buildings, Brussels, 16-17 October 2014

### 3.2.5.2 Promotional Management Board

The Promotion Management Board lay down, guide, coordinate and manage the policy and activities. It ensures that the activities of the committees and sub-committees are performant to the benefit of the steel construction industry. Since its creation, PMB has had three chairmen: Ing. Dipl. J.B. Schleich, Luxembourg, until 2003, then Mr. Bertrand Lemoine, France (2003-2012), and Mr. Yener Gur'es, Turkey (2012-2015).



**Jean-Baptiste Schleich**  
**Luxembourg**  
2000-2003



**Bertrand Lemoine**  
**France**  
2003-2012



**Yener Gur'es**  
**Turkey**  
2012-...

Figure 20: PMB Chairmen

Since the inception of the PMB, several changes have been performed in the organisation of the PMB committees. Table 4 illustrates these changes and shows all the committees that already have existed under MDTB or PMB. At the beginning, the PMB chairman was strongly involved in the strategic business plan of ECCS and represented ECCS in high level negotiations. Under the chairmanship of Bertrand Lemoine, in 2003, the advisory committees (AC) were changed into Market committees. Later, in order to improve the efficiency of their works, the five Market Committees were disbanded and merged into two main committees, Buildings (the actual PMB) and Bridges (former MC3 or AC3). In 2015, the PMB deals not only with buildings but also with the development of the ECCS Awards (AC4) and of the bridge market (AC3). The Promotional activities are detailed in chapter 5.

**Table 4: Evolution of the Advisory Committees (chairmen)**

1955	1988	1995	2005	2012	2015
<b>AC1</b> - Multi-Storey Buildings (R.A.C. Latter, UK)	<b>AC1</b> - Publications and Advisory (P. Le Pense, FR) <b>AC3</b> - Bridges (J.P. Epinoux, FR)	<b>MC1</b> - Multi-storey Buildings: High rise Residential Building (chair to be appointed)	<b>Bridge Committee</b> (Falko Schröter, DE)	<b>Bridge Committee</b> (Robert Dubois, FR)	<b>AC3</b> - Bridge Committee (Oliver Hechler, LU)
<b>AC3</b> - Bridges (L. van Osch, NL)	<b>AC4</b> - Use of steel in Refurbishment of Structures (A. de Luca, IT)	<b>MC2</b> - Sustainability (Roger Plank, UK)			<b>AC4</b> - Awards Committee (Lasse Kilvaer, FI)
<b>AC4</b> - Steel in Refurbishment of Structures (A. de Luca, IT)	<b>AC5</b> - Application of Eurocode 3 (H.J. Gettins, UK)	<b>MC3</b> - Bridges (Falko Schröter, DE)			
<b>PEC</b> - Promotional & Economic Committee (J. Roret, FR)	<b>AC6</b> - Structural Design and Research (R. Kindmann, D)	<b>MC4</b> - Single Storey Building (Robert Brandsen, NL)			
	<b>AC7</b> - Press and Public Relations (R.A.C. Latter, UK)	<b>MC5</b> - Marketing (Jo Naessens, LU)			
	<b>AC8</b> - Statistics and Market Research (G.H. Taylor, UK)				
	<b>AC9</b> - Architectural Aspects of Steel Construction (R. Plank, UK)				
	<b>Contract conditions committee</b>				

#### Promotional activities:

- Website, Facebook & LinkedIn;
- Newsletter: sent to about 50 000 addresses each month, to inform about the publications, the events, news, project results, etc...;
- Awards (see details in chapter 5);
- Architecture case studies (issues of the architecture case studies *Steel Stahl Acier* are published in collaboration with Ernst & Sohn);
- Events: Eurosteel, Bridge conferences (more details in the Bridge Committee section, chapter 5);
- Continuous development of the online Platform for Steel Construction;
- Development of the ECCS Academy (see details in chapter 5).

### 3.2.6 European Networking

In 2015, ECCS has developed a very large and powerful Networking around Europe:

#### 3.2.6.1 CEN and ISO Committees

Several members of ECCS are also members of CEN and/or ISO committees. The ECCS technical committees also work in close collaboration with CEN, as detailed in chapter 4 (Technical developments).

- CEN/TC 250: Structural Eurocodes,
- CEN/TC 135: Execution of Steel and Aluminium Structures
- CEN/TC 127: Fire Safety in buildings
- CEN/TC 350: Sustainable of Construction Works
- CEN/TC 371: Project Committee - Energy Performance of Building project group
- ISO/TC 167: Steel and aluminium structures  
WG 3 Execution of steel structures

#### 3.2.6.2 European Funding for R&D

The ECCS has had a long tradition of participation into European research programmes, especially under the lead of A. Carpena in the eighties. Today ECCS participates in several RFCS and FP7 projects (see previous Table 3 in section 3.2.5.1).

#### 3.2.6.3 Influence Groups

ECCS is member or has feedback from several European Groups:

- European Council for Construction Research, Development and Innovation (ECCREDI)
- European Steel Technology Platform (ESTEP)
- European Construction Technology Platform (ECTP)
- Energy Efficient Buildings Association (E2BA)
- Comité International pour la recherche et l'innovation dans le Bâtiment et la Construction (CIB)
- European Construction Forum (ECF)
- FOCOPE - The Forum in the European Parliament for Construction
- European Council for Architects (ACE)
- European Council of Civil Engineers (ECCE)

### 3.2.7 General Secretariat

The General Secretary is appointed by a General Meeting upon the proposal of the Executive Board. As the chief operating officer of the Convention he/she is an ex-officio member of all its main bodies and committees. In this capacity he/she is responsible for

- Conducting the current administrative operations;
- Preparing the meetings of the main bodies and implementing their decisions;
- Keeping contacts with the Brussels authorities of the European Commission and with international research associations;
- Coordinating and supporting the promotional and technical work in conjunction with the PMB and TMB;
- Running the publishing house of the Convention;
- The public relations of the Convention and issuing a periodical newsletter.

In the course of the Convention's history the activities of the General Secretariat depended very much on the personalities concerned. Pictures of former and actual General Secretaries are depicted in Figure 21.

At the beginning, as he had played a large part in the early negotiations, Dr. M. Baeschlin, the Director of the Swiss Association of Steelwork fabricators, was elected General Secretary, a position he was to maintain until he retired in 1969. His merit was to have substantially contributed to the founding of the Convention and he conducted, with remarkable diplomacy, the participation of the member associations in the Convention's activities.

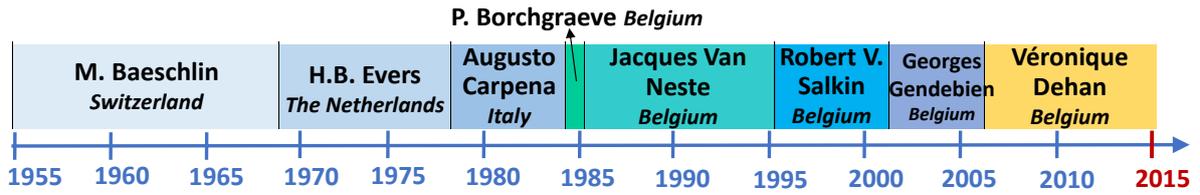
It was then that Ir. H.B. Evers of the Dutch Staalbouwkundig Genootschap became Administrative General Secretary and the official domicile of the Convention moved from Zürich to Rotterdam. At the same time, Dr. D. Sfintesco of the French Centre Technique Industriel de la Construction Métallique in Paris was elected Technical General Secretary, a position he had already filled unofficially since the inception of the Convention by cooperating with Dr. Baeschlin. His most competent contribution which has been recognized on an international level, has been marked by the considerable development of the Convention's technical activities aimed at progressing the constructional steelwork industry in the context of the European Common Market.

After his retirement in 1978 he was succeeded by Dr. A. Carpena from Milan who had already been active in different Committees of the Convention. His office being in Brussels, he was able to keep close contacts with the headquarters of the European Commission. When H.B. Evers retired in 1980, Dr. Carpena assumed the joint role of the first full time General Secretary. Unfortunately Dr. Carpena passed away in 1984, mourned by his colleagues in the Convention and the engineering profession. This sad event created an unexpected gap which was filled for an interim period by a team consisting of the Chairmen of the Executive and Technical Boards and the President of the year, Mr. P. Borchgraeve of the Centre Belgo-Luxembourgeois d'Information de l'Acier, who took care of the secretariat in Brussels also in the following year.

With the annual assembly of 1985, the newly elected General Secretary Mr. J. Van Neste from Liège, a former manager from Cockerill, the Belgian steel industry, took up his appointment. He was engaged by Mr. Geilinger, with a roadmap containing five objectives that he reached during his mandate. He completed the Lexicon after 10 years of past work and he increased the number of publications from about hundreds to 2000 in a few years. He managed to

develop deeper contacts with the steel industry, he brought four new members (Denmark, Spain, Turkey and Romania), and consequently he raised the accounts of the Association without increasing the contributions of the members. In 1986, he moved the Office from the extremely expensive *Blue Tower*, Avenue Louise, to the Avenue des Ombrages, where it is still located. He is also at the origin of the 1<sup>st</sup> Edition of the *ECCS History and Achievements* publication, 30 years ago.

In 1995, Mr. Robert V. Salkin succeeded to Mr. Van Neste, and managed the Association during six years. He conducted successfully a Joint Programme with the steel industry, initiated especially by Robert C. Latter from the former British Steel. After two mandates, Mr. Salkin handed over his responsibility to Mr. Georges Gendebien, active in the cooling and engineering industry. When the contract of Mr. Georges Gendebien was terminated in 2006, Mrs. Véronique Dehan took over the General Secretariat. Mrs. Dehan began to work at the Association as a secretary in 1993, with Mr. Van Neste, first, then with Mr. Salkin. During these 13 years beside these two General Secretaries, she learned the management of the Association and get acquainted with the steel construction matters.



**Augusto Carpena**  
*Italy*  
1978-1984



**Paul Borchgraeve**  
*Belgium*  
1984-1985



**Jacques Van Neste**  
*Belgium*  
1985-1995



**Robert V. Salkin**  
*Belgium*  
1995-2001



**Georges Gendebien**  
*Belgium*  
2001-2006



**Véronique Dehan**  
*Belgium*  
2006-...

**Figure 21: ECCS General Secretaries**



## 4 Technical Activities

### 4.1 Actual Technical committees

#### 4.1.1 Technical committee TC3 – Fire Safety

TC 3 is the Technical Committee responsible for Fire Safety in Steel and Composite buildings. The purpose of TC 3 is to contribute to the overall objectives of the ECCS under the point of view of Fire Safety. TC 3 aims at promoting developments in industry, research and teaching communities that lead toward increased understanding and knowledge of fire safety of steel and composite construction.

The first chairman of the committee was Professor J. Witteveen from TNO, Delft, The Netherlands, followed by Margaret Law from Ove Arup and Partners, London, UK. At the beginning of the 90's, Jean-Paul Favre from Switzerland, was elected chairman and chaired for about 10 years. Then it was Professor Peter Schaumann from Hannover University, Germany (2002-2014), who was succeeded in 2014 by Professor Paulo Vila Real from the University of Aveiro, Portugal. Figure 22 depicts some members in an annual TC 3 meeting.



**Figure 22: Annual TC3 meeting, 15<sup>th</sup>-16<sup>th</sup> September 2011, AFNOR, Paris**

The most important contribution of TC 3 includes the following aspects: i) basic concepts of fire safety of steel and composite structures for buildings in view of supporting the acceptance of using performance – based approaches in the design of structures; ii) use of advance calculation models to perform Fire Safety Engineering; iii) behaviour of steel and composite members and of global structures under natural fires; iv) effect of passive and active fire safety measures on the behaviour of the structures; v) design rules to be included in national and international codes for fire safety of steel and composite structures and vi) develop fire design publications to help designers in designing more economical and safe structures.

TC 3 has been very active in developing fire design publication during the last three decades. In 1983 ECCS issued the “European Recommendations for the Fire Safety of Steel Structures” (Figure 23a), which was the first basic fire design publication developed by TC 3. This publication dealt only with the traditional approach of assessing isolated steel members exposed to the standard fire curve, ISO 834, but it introduced simple calculation methods in place of using the expensive fire tests to support fire resistance verification of single members. This first publication, that can be considered the precursor of the actual fire part of Eurocode

3, was followed by numerous others, based on research work and large scale tests. Some examples of topics covered by these publications are the Fire Resistance of Concrete Slabs and Centrally Loaded Composite Steel-Concrete Columns Exposed to the Standard Fire, the so-called “Euro-Nomogram” for a quick assessment of the fire resistance of steel structures, Fire Safety of Open Car Parks and, more recently, Membrane Action of Composite Structures in Case of Fire (Figure 23c). Between the transition from the ENV-stage into European Norms, TC 3 has developed the “Model Code on Fire Safety” (Figure 23b) published by ECCS in 2001 and incorporating most of the new findings that were included in the Eurocode 3 and Eurocode 4. In the foreword of this publication it is written that the Model Code “*intends to be a solid, scientifically based instrument, facilitating the final issue of the EN 1993-1-2 (Fire Design of Steel Structures), the EN 1994-1-2 (Fire Design of Composite Steel and Concrete Structures) and the EN 1991-1-2 defining the Actions on Structures independently of the structural material used*”. The last publication involving TC 3 members, Jean-Marc Franssen and Paulo Vila Real, belongs to the Eurocode Design Manual series (Figure 23d), jointly edited by ECCS and Ernst & Sohn a Wiley Company in 2010 and entitled Fire Design of Steel Structures. The 2<sup>nd</sup> edition of this manual is being prepared to be published during 2015.

For the new generation of the fire part of Eurocode 3 and Eurocode 4 numerous members of TC 3 are involved in the following topics: i) membrane effect on composite structures; ii) members with Class 4 cross-sections; iii) slim floor beams; iv) beams with large web openings; v) concrete filled steel tubes and vi) stainless steel structures.

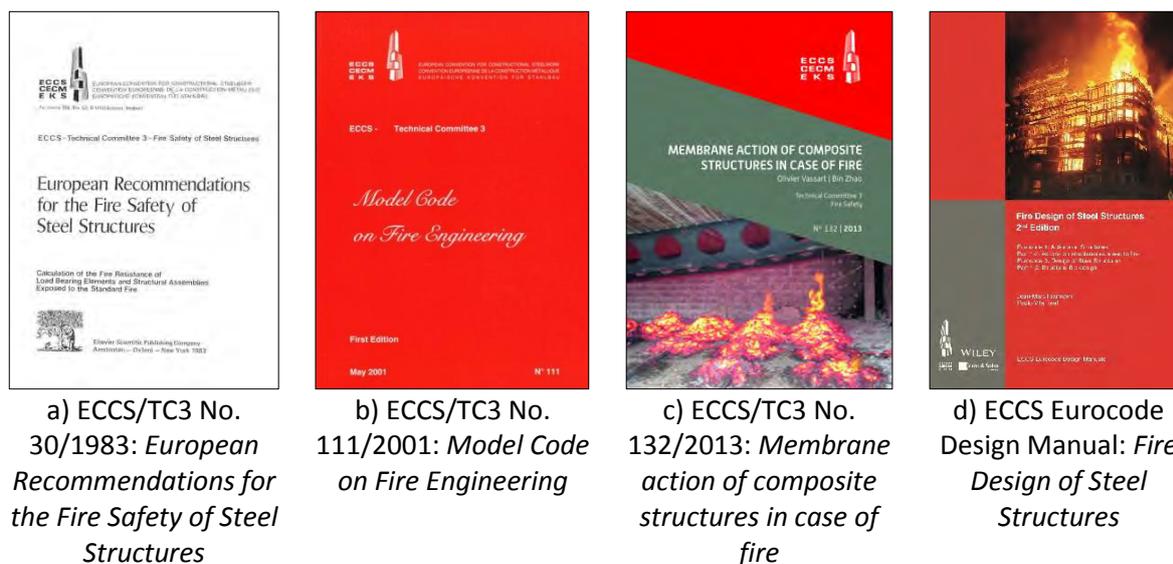


Figure 23: ECCS/TC3 relevant publications

May, 2015  
Prof. Paulo Vila Real, Chairman of TC3

#### 4.1.2 Technical committee TC6 – Fatigue and Fracture

TC 6 was created in 1979 to draft the first European fatigue recommendations. The first meeting was held on 20 April 1979, in Lausanne. At that time, a working document had been prepared by the former ECCS Committee 9 “Welded Joints”. During a five year period, nine committee meetings were held to result in ECCS publication N° 43, in 1985 (Figure 24a). This document had large international recognition and was translated in several languages, and served as a basis for the fatigue parts in the first edition of Eurocodes 3 and 4. Aside, the

committee produced other documents such as: “Good Design Practice - A Guideline for Fatigue Design” (Figure 24b), ECCS publication N° 105 (2000), and “Assessment of Existing Steel Structures: Recommendations for Estimation of Remaining Fatigue Life” (Figure 24c), joint ECCS-JRC publication (2008). In 2011, its members also participated in drafting of ECCS Eurocode Design Manual “Fatigue Design of Steel and Composite Structures” (Figure 24d). In its 36 years of existence, the chairmen of the committee have been Manfred Hirt (1979-1999), Alain Nussbaumer (1999-2005) and Mladen Lukić (2005-present). Figure 25 depicts TC 6 members during a meeting of the group in 2011.



a) ECCS/TC6 No. 43/1985: *Recommendations For the Fatigue Design of Steel Structures*

b) ECCS/TC6 No. 105/2000: *Good Design Practice – A Guideline for Fatigue Design*

c) ECCS-JRC 2008: *Assessment of Existing Steel Structures: Recommendations for Estimation of Remaining Fatigue Life*

d) ECCS Eurocode Design Manual: *Fatigue Design of Steel and Composite Structures*

**Figure 24: TC6 relevant publications**



**Figure 25: TC6 meeting, 11<sup>th</sup> – 12<sup>th</sup> April 2011, TU Graz, Austria**

Since the publication of the first fatigue recommendations, the committee has constantly been the main expert group for CEN TC 250 Subcommittee 3, assisting in the drafting and updating of Eurocode 3, part 1-9 “Fatigue”, as well as part 1-10 “Material toughness and through-thickness properties”. The main issues in the years to come, never treated or never in a conclusive manner, will be: correct application of hot spot stress method in fatigue, influence of execution classes on fatigue strength, fatigue analysis in the case of complex stress patterns, fatigue strength improvement due to post-weld treatment, and influence of seismic actions on brittle fracture of components. The meetings of the TC6 are held together

with those of the respective CEN Working Groups for parts 1-9 and 1-10 of Eurocode 3. In that light, the majority of the background work for the evolution of these parts of the steel Eurocode is being done within the committee and therefore ECCS which brings the latter an added value for its members.

May, 2015

Mladen Lukic, Chairman of TC6

#### 4.1.3 Technical committee TC7 – Cold-formed thin walled sheet steel in buildings

The ECCS thin walled cold-formed steel group is established on initiative of Rolf Baehre in 1973/1974. Quotation from a part of a speech of Rolf Baehre in 2003:

*"It may be allowed to make some short statements about this Committee which was established in 1974 in Stockholm, where I have been working at that time.*

*The story of the Committee started some years earlier than 1974, when the Swedish Institute for Steel Constructions applied for the ECCS (European Convention for Constructional Steelwork) to establish a Committee for promoting and developing "Thin-walled Sheet Steel Structures in Building Constructions. During two years' time the ECCS-Organisation said "NO". The ECCS is not responsible for sheet steel construction, which obviously means "roofing" and "craft-work", this was too simple for the ECCS. I remember an ECCS-Meeting in Graz- it must have been 1973- when Sweden for the third time asked to establish such Committee. After a turbulent debate under the chairmanship of Dr. Sfintesco and with the support of the English and the Dutch delegations, the late Professor Beer from Austria, who at that time had a weighty position as one of the members of the foundation within the ECCS said: "Ok, if Sweden absolutely claims that Committee, they may have it!" and Professor Massonet, another important member of the ECCS raised and claimed"...but no terms of stability in that Committee!". Well: the ice was broken and a dynamical development could start.*

*After having asked the ECCS-Member Nations about their intended membership the Technical Committee 17 was founded at the first meeting in Stockholm in the beginning of 1974 with delegates from Great Britain (Eric Bryan), Italy (Julio Ballio), Belgium (Gilbert Kreutz), Norway (Esben Thrane), Sweden (Lars Wallin) together with Per Thomasson as my and the Committee's secretary at our Institute for Steel and Timber Structures at the Royal Institute of Technology in Stockholm.*

*We started our work immediately to creating technical rules for the Stressed Skin Design, which two years later also should be the first publication of the Committee. This year 1974 we had three other meetings in Paris, Salzburg and Manchester - really a super start from the pole position.*

*But back to that first meeting, we had a very nice dinner at a restaurant "Five Small Houses" in the old town of Stockholm and that was the beginning of a durable friendship among the members and probably the beginning of what the ECCS later on called: "The Singing Committee". You also may remember that we at a Meeting, ten years later, in 1984 in Bad Laasphe, distributed the TC7 - Song Book, which had been dedicated to the 2<sup>nd</sup> Chairman Eric Bryan and his wife Jean. This Song Book, covering most of the member countries most well-known songs, has afterwards often accompanied our meetings wherever we have been, Innsbruck, Pavia, Roma, Helsinki, Windsor Castle, Luxembourg, Potsdam, Dürnstein, Delft, Pisa, Lausanne, Istanbul, Karlsruhe and much more beautiful places. Our intention has always been to be on the right place in the right region at the right time of the year, enjoying our*

*personal meetings but having worked hard and fruitful for the times between the meetings. I think, this was an important part of the (even international recognized) success of our Committee.*

*To make a long and fruitful work of the Committee short: Short time after the establishment the representatives of many other member nations joined the Committee, followed by USA as an associated member with Teoman Peköz from Cornell University and an ECCS-CIB Joint Group with members from Eastern Germany, Poland, Hungary, and Czechoslovakia, in order to cover experiences in the field of light-weight structures from other countries outside the European Convention for Constructional Steelwork. And so we have done.”*

Along the years, the organisation of the committee has changed, and ten technical working groups were created to work on specific current issues. In 2015, two working groups are active: TWG 7.5 “Practical improvements of Design Guidelines”, chaired by Bettina Brune, Germany, and TWG 7.9 “Sandwich panels and related subjects”, chaired by Thomas Misiek, Germany. From 1977, 181 experts were or have been active in TC7, which allowed TC7 to publish more than 20 publications; some of them are illustrated in Figure 29. Today, 17 countries are active in this committee.



**Figure 26: TC7 relevant publications**

August 2015

Jörg Lange, Chairman of TC7

#### 4.1.4 Technical committee TC8 – Structural stability

Technical Committee 8 (TC 8) of ECCS is active in the field of stability of steel structures: individual members, beams and columns, and skeletal, plate or shell structures. Within TC 8, new design rules and recommendations are developed and discussed to fill the gaps present in the European codes. Existing design rules are studied and, where possible, modified for easier application by designers, structural engineers, fabricators and steel construction companies. It is the aim of TC8 to provide scientifically sound input on stability design rules to

European code writing bodies - in particular CEN/TC250/SC3 and its evolution groups - and to consult with these bodies.

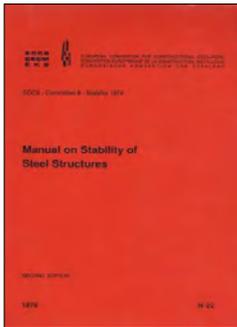
TC 8 was first established in the year 1958 and was chaired by Prof. Beer of Graz University, Austria, from 1958 to 1972. The focus at that time was on axially loaded columns. Combined experimental and numerical work, within an International cooperation, led to the establishment of the European buckling curves, still in use today as part of Eurocode 3 (EN1993) on steel structures. The second chairman of TC 8 was Dr. Sfantescio of Centre Technique Industriel de la Construction Métallique (CTICM), Paris, France (from 1972 to 1980). In that period, the work of the committee extended to all kinds of stability problems met in practice. In 1976 the first "Manual on Stability" (Figure 27a) was issued, which formed the basis for the slightly later "European Recommendations for Steel Construction" (Figure 27b), a predecessor of Eurocode 3 (EN1993). Under the chairmanship of Prof. Massonet of Université de Liège, Belgium who led the committee from 1980 to 1987, the main interest was in plate stability problems as encountered in bridge construction. An important publication in this period was the one entitled "Ultimate limit state calculation of sway frames with rigid joints" by Prof. Vogel (ECCS publication no. 33, 1984). The work on the "European Recommendations for Steel Construction" continued resulting in a 2<sup>nd</sup> edition in 1983 and a 3<sup>rd</sup> edition in 1984. From 1987 to 1993 TC 8 was led by Prof. Vandepitte of Ghent University, Belgium. His influence reaches until today with Ghent University contributing significantly to the knowledge on the stability of steel shell structures. The continuing work on the "European Recommendations for Steel Construction" resulted in a 4<sup>th</sup> edition in 1988.

In 1993 Prof Lindner of Technische Universität Berlin, Germany, took over the chairmanship until 2009. Close cooperation was established with the committee responsible for drafting Eurocode 3 on steel structures (EN1993), namely committee CEN/TC250/SC3. Technical input was provided for prEN1993 and later EN1993. Work continued on all kinds of stability problems that occur in practice. Interaction formulae were developed for assessing the stability of beam-columns. Two teams had worked on these interaction formulae independently: the Austrian/German and the French/ Belgian team resulting in the two sets of interaction factors currently present in EN1993-1-1. It was TC 8 that established the common general interaction formulae of clause 6.3.3(4) of EN1993 to accommodate the two sets. This work was documented (Figure 27c) in "Rules for member stability in EN1993-1-1 – background documentation and design guidelines" (ECCS publication no. 119, 2006). TC 8 also defined the field of application of the General Method (clause 6.3.4 of EN1993-1-1) and initiated work on ECCS recommendations under the working title "Design by FEM of slender structures". In this period also new editions of "Buckling of Steel Shells – European design Recommendations" appeared thanks to the efforts of Prof. Rotter and Prof. Schmidt: the 4<sup>th</sup> edition in 1988 and the 5<sup>th</sup> in 2008. Membership of TC 8 grew over the years to about 20 persons (Figure 28) meeting twice a year since 1998.

In 2009 Prof. Snijder of Eindhoven University of Technology, The Netherlands, took over the chair of TC 8. Various topics were treated and major contributions were made to amendments for the future generation of the Eurocodes. Among these topics are the following: i) Proposal for harmonized Buckling Curves for flexural, torsional flexural and lateral torsional buckling of uniform members; ii) Development of a consistent design procedure for tapered columns and beams; iii) Structural design rules for elliptical hollow sections and proposed additions to EN1993-1-1; iv) Application and validation of the interaction formulae in EN1993-1-1 for

stability verification of web-tapered beam-columns; v) Design rules in Eurocode 3 (EC3) for angles; vi) Safety assessment of EC3 stability design rules for lateral torsional buckling of beams and for flexural buckling of columns; vii) On the behaviour and EC3 design of T-section columns and beam-columns; etc....

In 2013 an updated version of “Buckling of Steel Shells - European Design Recommendations” appeared as a 5<sup>th</sup> Edition, Revised Second Impression (Figure 27d). Also, the work on ECCS recommendations “Design by FEM of slender structures” continued hopefully to result in a first edition in 2016.



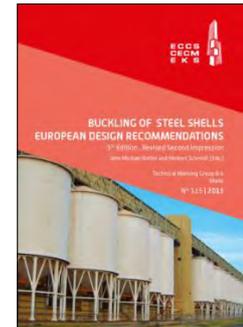
a) ECCS/TC8 No. 22/1976: *Manual on Stability of Steel Structures*



b) ECCS/TC8 No. 23/1978: *European Recommendations for Steel Construction*



c) ECCS/TC8 No. 119/2006: *Rules for Member Stability in EN 1993-1-1. Background documentation and design guidelines*



d) ECCS/TC8 No. 125/2013: *Buckling Steel Shells. European Design Recommendations, revised 5<sup>th</sup> edition*

**Figure 27: TC8 relevant publications**



**Figure 28: Members of TC 8 during the Berlin meeting in 2009, Germany**

*June 2015*

*Bert Snijder, chairman of TC8, Professor at Eindhoven University of Technology, The Netherlands*

*Joachim Lindner, former chairman of TC8, Professor Emeritus of Technische Universität Berlin, Germany*

#### 4.1.5 Technical committee TC9 – manufacturing and erection standards

When ECCS was formed it is fair to say that steel construction was essentially a craft industry reliant primarily on the skills of its operatives. Since that time steel construction has become a modern manufacturing industry and much of the effort of TC9 has focused on supporting this progress with appropriate technical standards.

In parallel with this change, ECCS has also been instrumental in bringing the various national standards into the common framework of European Standards. Whilst the Eurocodes have provided the design requirements, the fabrication and erection requirements draw also on a wide range of supporting standards. TC9 has taken on the task of reviewing supporting standards relevant to such topics as steel products, welding, bolting, surface treatment and site surveying.

In particular, much of the early work of TC9 centred around drafting sections of the ECCS Recommendations dealing with what is now termed “execution”. Subsequently those sections formed the core of the reference standards for execution incorporated in the pre-standard ENV draft of Eurocode 3. At that stage it was evident that there were still gaps in the coverage of the ECCS references – for instance neither thin-gauge cold formed sections nor stainless steel were covered.

Hence, CEN/TC135 was constituted in 1988 to provide the necessary supporting drafts that became the six Parts of ENV 1090. Throughout the development of the ENV and later EN drafts of 1090, ECCS/TC9 continued to provide supporting input and comment – in particular focusing on the practical implementation of the rules as they would affect steel fabricators and erectors.

Of those persons who were active in TC9, it is invidious to single out individuals for special citation. However, in terms of national activity it is fair to mention Belgium, France and the Netherlands as having contributed significantly to the early debates concerning common rules for tightening of pre-loaded bolts – a topic that has been much debated over the years.

In TC9 the debate on welding has been able to draw on the wide range of International Standards that have been published as EN ISO standards during this period.

In 1995 the Construction Products Directive led to CEN/TC135 being mandated to develop a harmonised standard for the manufacture of structural steel components, and ENV 1090 was used as the basis of EN 1090-2 – the supporting technical requirements (Figure 29a). The harmonised part, EN 1090-1, was developed as the basis for factory production control (FPC) that underpins the requirement for CE Marking of structural steel components. TC9 was again active in supporting the development of the FPC requirements and the relationship with modern quality management practice that had by then been widely adopted by the steelwork manufacturers. This led to the publication of BCSA publication “Guide to the CE marking of structural steelwork”.

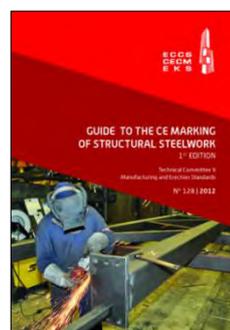
Until BCSA decided to give up its membership of ECCS, the Chairmanship of TC9 had been held for many years by British representatives – Harry Arch, Tom Gibson, John Allen and Roger Pope. The baton passed to Kjetil Myhre from Norway in 2010 and in this recent period the focus has moved towards the implications of EN 1090 how the harmonised standard EN 1090-1 is applied in practice.

The TC9 adapted the BCSA publication “Guide to the CE marking of structural steelwork” to the European market and supplemented the publication with the CPR requirements and a

checklist for inspection of FPC. The publication was issued as an ECCS recommendation no. 128 in 2012 (Figure 29b). Other activities have been to develop a FAQ list to EN 1090-1 which has been published on ECCS website, and drafting a list of products who either can or cannot be CE marked on the basis of EN 1090-1:2009+A1:2011.



a) ECCS/TC9 No. 93/1997: *Executing Steel Structures to Eurocodes 3 and 4: Guide to ENV 1090-1*



b) ECCS/TC9 No. 128/2012: *Guide to the CE marking of structural steelwork*

**Figure 29: TC9 publications**

*July, 2015*

*Roger Pope, Former Chairman of TC9*

*Kjetil Myhre, Chairman of TC9*

#### **4.1.6 Technical committee TC10 – structural connections**

The Technical Committee 10 (TC 10) was established in the mid-seventies of the previous century under the chairmanship of Professor ir. A.A. van Douwen. In 1988 he was succeeded by Professor ir. J.W.B. Stark. In 1998 Professor ir. F.S.K. Bijlaard became the chairman and he was succeeded in 2012 by the present chairman Professor Dr.-Ing. T. Ummenhofer.

The main activities can be captured in the topics connectors, welded connections, simple joints, beam-to-column joints, hollow section joints and earthquake resistant joints. TC 10 is forming an international platform where research on connections can be discussed, harmonised and co-ordinated to avoid unnecessary research and duplication on connections and joints as well as defining gaps in knowledge, further development and future research. Drafting practical rules and design aids for design and fabrication of connections in structural steelwork is also an aim of TC 10. The primarily object of TC 10 is, however, to prepare background material for and assist improving the design rules in Eurocode 3 and Eurocode 4 concerning connections and joints and contribute in CEN-TC 135 on execution rules for steel structures. The members are discussing and coordinating common research activities (Figure 30).

Liaisons have been maintained with AC 1 "Publications and Advisory", AC 5 "Application of Eurocode 3", AC 6 "Structural Design and Research", and are still maintained with TC 6 "Fatigue", TC 7 "Thin Walled Elements", TC 8 "Stability" and TC 11 "Composite Construction". Other co-operation is maintained with CEN-TC 250/SC 3 on Eurocode 3, CEN-TC 250/SC 4 on EC 4, CEN-TC 135 on EN 1090, CEN TC 185 on Product Standards for bolts, National Standards Organisations, International Institute of Welding (IIW), Committee XV, CIDECT, American Institute of Steel Construction (AISC), Canadian Institute of Steel Construction (CISC) and USA - Research Council on Structural Connections. In addition, every four years the Workshop on

Structural Connections is organised in close cooperation between ECCS-TC10 and AISC. The next one will take place in Boston in May 2016.



**Figure 30: 104<sup>th</sup> Annual TC10 meeting, 10<sup>th</sup>-11<sup>th</sup> April 2014, Coimbra, Portugal**

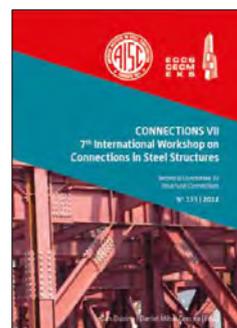
Publication through ECCS gives an acceptance status to the results reported and the complete list of publications and documents produced by TC10 is available via the "E-store" on the website from ECCS: [www.steelconstruct.com](http://www.steelconstruct.com). Figure 31a illustrates the first publication "Slip factors of connections with H.S.F.G. bolts" produced by TC10 in 1984. More recently, under the former Chairmanship of Frans Bijlaard "European Recommendations for the Design of Simple Joints in Steel Structures" (Figure 31b) was published in 2009, proposing practical guidelines for the design of simple joints commonly used in Europe. The design rules presented in this document are in full agreement with the principles of Eurocode 3, and in particular of Eurocode 3, part 1-8. Furthermore, "Connections VII – 7<sup>th</sup> International Workshop on Connections in Steel Structures" (Figure 31c) was published in 2012 after a workshop in Timisoara, Romania. It contains highly qualified and international contributions of participants to those workshops, that covered the topics of structural designs and codes, methods of analysis, connections for seismic effects, connections with hollow structural sections, bolting, bracing and truss connections. The book "Design of Joints in Steel and Composite Structures" (Figure 31d), being published in 2015, summarizes all issues in the current version of Eurocode 3, part 1-8, Design of Joints, as well as Eurocode 4, Design of Composite Steel and Concrete Structures.



a) ECCS/TC10 No. 37/1984: *Slip factors of connections with H.S.F.G. bolts*



b) ECCS/TC10 No. 126/2009: *European recommendations for the Design of Simple Joints in Steel Structures*



c) ECCS/TC10 No. 133/2012: *7<sup>th</sup> International Workshop on Connections in Steel Structures*



d) ECCS handbook in preparation: *Design of Joints in Steel and Composite Structures*

**Figure 31: TC10 relevant publications**

The main issues in the years to come will follow the persistent dynamic interests as well as necessities and will cover bonded joints and appropriate dimensioning concepts based on recent research results. We anticipate positive effects of the other TCs and continue to pursue further contributions to Eurocode 3 in the light of the current needs.

June, 2015

Thomas Ummenhofer, Chairman of TC10

#### 4.1.7 Technical committee TC11 – Composite Structures

The mission of ECCS-TC11 is to promote the use of constructional systems in which steel is used with other materials (typically concrete) to realise highly performing structures. The Committee's members are experts from industry and research institutions and represent a permanent observatory of research advances in the area of composite construction giving a contribution in bridging the gap between research and practice.

At the very beginning, before the creation of TC11, a joint committee was formed with participation of the International Association of Bridge and Structural Engineering (IABSE), the Euro-International Committee for Concrete (CEB), and the International Federation of Prestressing (FIP), under the chairmanship of D. Sfantesco, in order to produce a European Model Code reflecting the most recent findings in research and practical experience. This first publication was published by the Convention in 1981 (Figure 32a), and it was the main reference for the first version of Eurocode 4. In order to assure a continuous support in this field, which was becoming more and more important for many structural steel fabricators, a new Technical Committee on Composite Structures (TC 11) was set up in the 80's, under the chairmanship of Professor Helmut Bode from TU Kaiserslautern, Germany. In 1999, the publication "Design of Composite Joints for Buildings" (Figure 32b) was printed, with the aim to explain how beam-to-column and beam-to-beam connections may be deliberately designed with composite actions to provide quantifiable end restraint. Then in 2001, a collection of tables and graphs to design Composite Beams to Eurocode 4 (Figure 32c) were published, in order to provide design aids for composite beams using standard hot rolled steel sections and composite floors slabs comprising profiled steel decking and concrete, based on design principles and application rules from ENV 1994-1-1.



a) ECCS/TC11 No. 28/1981: *Model Code for Composite Structures*



b) ECCS/TC11 No. 109/1999: *Design of Composite Joints for Buildings*



c) ECCS/TC11 No. 113/2001: *Design Tables and Graphs for Composite Beams to Eurocode 4*



d) *Steel Construction* special issue (02/2015) on slim floors

**Figure 32: TC11 relevant publications**

In 2003, after the death of Professor Bode, Professor Markus Feldmann, from Germany, took over the chairmanship, until 2005. Then TC 11 slept in until 2009. From second half of 2009,

under chairmanship of Prof. Riccardo Zandonini, membership of TC11 increased from 15 full members and 2 corresponding members to 23 members plus 12 corresponding members that broadened TC11 action area worldwide; Figure 33 depicts members in a TC 11 meeting. During this period TC11 has been active mainly on three important aspects of composite constructions namely: i) shear connection systems and mechanisms of composite action in non-conventional composite elements, ii) composite frames with special focus on joints subjected to static and cyclic loadings and behaviour at elevated temperature and iii) shallow flooring systems with special attention to the interaction between bending moments resisted in the longitudinal and transverse directions, shear resistant mechanisms and the definition of effective width of the collaborating slab and deflections and vibrations due to the intrinsic high deformability of shallow elements. With reference to the first topic, a comprehensive state-of-the-art document, devoted to mechanical models for shear connections, partial interaction in composite elements and innovative shear connection systems, is currently in preparation. Concerning composite frames, a publication on composite joints is also under preparation. Finally, as for shallow floors, contributions by the TC11 members were published on a special issue of the Journal of Steel Construction (Figure 32d).



**Figure 33: Six-monthly TC11 meeting, 12<sup>th</sup> May 2012, Peikko Group's headoffice, Lathi, Finland**

TC11 plays an indirect role in the evolution of Eurocode 4. As policy of CEN TC 250/SC4 is to promote a performance based standard harmonized with Eurocodes 2 and 3; the documents under preparation by TC11 will be very important to give additional indications on specific topics.

*June, 2015*  
*Riccardo Zandonini, Chairman of TC11*

#### **4.1.8 Technical committee TC13 - Seismic design:**

TC13 committee was established about thirty years ago with the aim to promote the use of steel structures in seismic areas. Since the beginning, TC13 activities have been addressed towards both designers and standardization bodies. The mission of TC13 can be summarized as follows: i) to provide a comprehensive state-of-the-art on the ongoing research activities in the field of seismic design of steel structures; ii) to analyse the current status of European and worldwide codification; iii) to identify further research priorities and critical issues in the technical specifications; iv) to prepare background documents for the new generation of

Eurocode 8 (EN 1998); v) to develop specific tools for designers and constructors in order to promote the use of steel structures in seismic areas; vi) to disseminate the results.

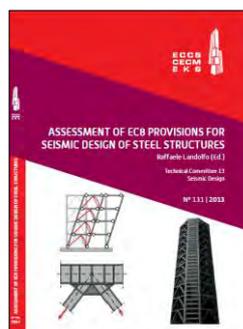
Under the former Chairmanship of Professor Federico M. Mazzolani, TC 13 published the “European Recommendations for steel structures in seismic zones” in 1988. These Recommendations were incorporated as the “Steel section” of the first edition of EN 1998-1. After this important result, the effort of TC 13 was addressed to the publication of the “ECCS Manual on Design of Steel Structures in Seismic Zones” (Figure 34a), which addressed practitioners with the basic principles of the codes and summarized the developments and the research results achieved within the period from the end of ‘70s to the beginning of ‘90s of the last century. In 2007, Prof Raffaele Landolfo, from University of Naples Federico II, Italy, was appointed as the new Chair of the Committee. The Committee membership changed also and, nowadays, 34 experts (24 full and 10 corresponding members), coming from all over the world, joined the Committee. The new course of the Committee officially started with the kick-off meeting held in Naples (Italy) on 16 May 2008 (Figure 35). In that occasion, a new action plan was defined and a set of priorities was identified, including: i) Identification of a list of weaknesses in the current codes; ii) Compilation of a list of questions from practicing engineers to create a list of priorities; iii) Creation of some technical working groups to cope with the identified weakness and to address the specific priorities; iv) Production of technical documents addressing these issues with the aim to contribute to the new generation of codes.



a) ECCS/TC13 No. 76/1994: *ECCS Manual on Design of Steel Structures in Seismic Zones*



b) TC13 special issue on Steel Construction, vol. 4(2) 2011



c) ECCS/TC13 No. 131/2013: *Assessment of EC8 Provisions for Seismic Design of Steel Structures*



d) ECCS handbook in preparation: *Design of steel structures for buildings in seismic areas*

**Figure 34: TC13 relevant publications**

Within the field of scientific and technical dissemination, the Committee promoted also a special issue on the journal “Steel Construction” on TC 13 activity (Figure 34b). Steel Construction is the official journal for ECCS- European Convention for Constructural Steelwork members since 2010 and it publishes peer reviewed papers covering the entire field of steel construction research.

In line with TC 13 mission and tradition, the work of the refurbished technical body was again effectively addressed to codification. With this regard, in 2013 the committee published the book “Assessment of EC8 Provisions for Seismic Design of Steel Structures” (Figure 34c), which summarizes all issues in the current version of EN 1998-1 needing clarification and/or development. A new TC13 book is in preparation, collecting issues related to the seismic design of steel buildings that may overcome the fallacies and weak points of the actual EN 1998-1: “Toward improved European codification for the seismic design of steel structures”.

Finally, TC 13 is working on a more ambitious project that is the publication of a new ECCS design manual, namely “Design of steel structures for buildings in seismic areas” authored by some of TC 13 experts (Figure 34d).

Nowadays, TC 13 members are also actively involved in the maintenance operations of the current version of the Eurocode 8. Indeed, CEN/TC250/SC8, during the meeting held in London on 8-9 January 2015, approved a resolution in which the Working Group 2 (WG2) – Steel and Composite Structures - has been established with the aim to deal with the seismic design of steel and composite structures (i.e. chapter 6 and 7 of EN 1998). With the same resolution, Prof Landolfo has been appointed as Convenor of this WG for the next three years (i.e. triennium 2015-2018). This decision implies that the efforts of TC 13 will be officially finalized to improve the current version of EN 1998. The main Eurocode 8 issues needing clarifications and revisions will be: Material overstrength, Selection of steel toughness, Local ductility, Design rules for connections in dissipative zones, new links in eccentrically braced frames, Behaviour factors, etc....



**Figure 35: TC13 kick-off meeting in Naples (16 May 2008); The Committee membership brings together 34 experts (24 full and 10 corresponding members), coming from all over the world.**

*June, 2015*

*Raffaele Landolfo, Chairman of TC13*

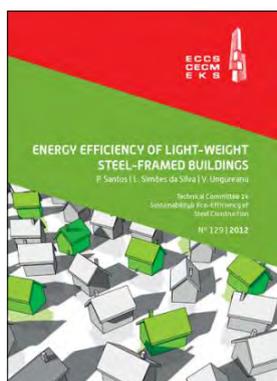
#### **4.1.9 Technical committee TC14 – Sustainability and Eco-Efficiency of steel construction**

TC14 is the Technical Committee within ECCS for Sustainability and Eco-Efficiency of Steel Construction. The committee aims to promote developments in industry, research and teaching communities that strengthen knowledge and capabilities in relation to sustainable steel construction. The broad area of the issues includes, for example, the following aspects:

- Management of overall building performance during the whole lifecycle;
- Techniques for the improved environmental performance;
- Techniques for a high quality and comfort of the indoor environment;
- Energy efficiency;
- Minimization of resources and use of raw materials.

TC 14 was created in 2007, under the name “Sustainability and Eco-Efficiency of Steel Buildings”, and the first meeting was held on 5<sup>th</sup> March 2008 in Brussels. Since the beginning, TC 14 is chaired by Luís Bragança, from Portugal.

The very first objective was to prepare a promotional tool (leaflet or brochure) to promote the constructional steelwork as a sustainable choice and to influence the public/authorities perception about steel buildings around Europe. Later, in 2012, two publications have been published: “Energy efficiency of light-weight steel-framed buildings” and “Concepts and methods for steel intensive building projects” (Figure 36). The first one intends to provide guidelines for good thermal behaviour and high energy efficiency in cold-formed low-rise residential buildings, and the second one is the book of proceedings of the workshop on concepts and methods for steel intensive building projects, and it is a joint effort of the SB\_Steel Project, Technical Committee TC14 of ECCS and the WG3 of the ESTEP.



a) ECCS/TC14 No. 129/2012: *Energy efficiency of light-weight steel-framed buildings*



b) ECCS/TC14 No. 130/2012: *Concepts and methods for steel intensive building projects*

**Figure 36: TC14 relevant publications**

*July, 2015*

*Luís Bragança, Chairman of TC14*

#### 4.1.10 Technical committee TC16 – Wind Energy Support Structures

The TC16 was founded in September 2014 with the objective to deal with "Wind Energy Supporting Structures". The chairman of the group is Professor Peter Schaumann, from Leibniz University Hannover, Germany. The constitutive meeting was in Hannover on April 8<sup>th</sup>, 2015 (Figure 37). This committee joins academic members and industrial partners.



**Figure 37: TC16 kick-off meeting in Hannover, Germany (8 April 2015)**

The offshore and onshore wind energy market is growing fast supporting the change of fossil sources to renewable energy resources. Achievement of higher rated power of wind energy

converters, which are supported by slender steel towers as the most common structural concept, requires knowledge, research and development in the area of design, fabrication, installation and maintenance.

From the design perspective different areas are of interest. These are overall design, stability (shells), connections (bolted, welded, grouted) and fatigue (VHCF) of course. There should be a strong link to the existing TCs in ECCS addressing these design related topics for support structures of buildings and bridges. The use of high strength materials and the sustainability of the steel supporting structures is of additional relevance. The issue of the TC 16 will be to support design, fabrication - covering the existing gap between both - and code development.

It is crucial to influence the code development on the European level. Up to now, wind energy standards are managed by IEC (International Electrotechnical Commission). Therefore, wind energy relevant design rules should be introduced into the Eurocode as far as possible. TC 16's activities will address onshore and offshore turbines.

*June, 2015*

*Peter Schaumann, Chairman of TC16*

## 4.2 Former Technical Committees

### 4.2.1 Technical committee TC1 – Structural Safety

Any code must ensure that structures are fit for their function, and bring enough security to users. A realistic evaluation of individual actions (wind, snow, loads, seismic forces, etc....), and an appreciation of their possible simultaneous occurrence, as well as the knowledge of the acceptable range of material properties is needed. The reference to the probabilistic concepts in code drafting led to the very important committee 1 "Structural Safety", chaired initially by the late Professors Lorin and Pousset (France), then by Professor G. Ballio, Italy, and finally by Prof. G. Sedlacek of Germany. TC 1 published recommendations on Load factors based on probabilistic concepts in 1975. The work of TC1 had great importance in view of the Eurocode 0 (Basis of structural design) and Eurocode 1 on Actions.

### 4.2.2 Technical committee TC2 – Aluminium Alloy Structures

The formation of a technical Committee on aluminium structures under the chairmanship of Professor Mazzolani of Naples, Italy, was due to the fact that aluminium parts are sometimes used as complementary to steel structures and that several member associations and fabricators include the use of aluminium in the domain of their activities. The European recommendations for Aluminium Alloy Structures, published in 1978 (Figure 38a), are consistent with those given for steel. G. Valtinat of Germany was the last chairman of TC2, and in 1992, the European Recommendations for Fatigue Design of Aluminium Alloy Structures were published (Figure 38b).



a) ECCS/TC2 No. 26/1978: *European Recommendations for Alluminium Alloy Structures*



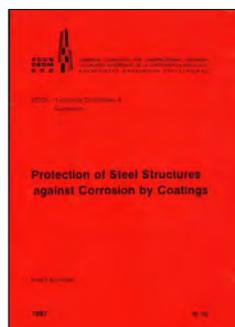
b) ECCS/TC2 No. 68/1992: *European Recommendations for Alluminium Alloy Structures – Fatigue Design*

**Figure 38: TC2 publications**

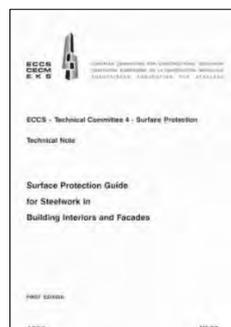
#### 4.2.3 Technical committee TC4 – Surface Protection

Technical Committee 4 (TC 4) was dedicated to the study of active protection against corrosion in different natural environments of steel structures. The objective of TC 4 was to show how to improve the design of the constructional elements in order to avoid entrapment of moisture and to allow a correct maintenance, to provide advices for a correct choice of paint system for galvanized surfaces, taking into account the mechanical and aesthetic properties, the requested durability and the environmental conditions, and to provide information about surface preparation, painting procedures, protection of bolted connections, etc....

This committee was created at the beginning of the Convention. The first publication was published in 1987 (see Figure 1a), under the chairmanship of C.L. Bijl, The Netherlands, with the aim to draw attention to errors which should be avoided and to formalize some useful advice for effective protection of the steel. Two other publications were prepared under the chairmanship of J.T. Robinson, from United Kingdom: “Surface Protection Guide for Steelwork in Building Interiors and Facades” (Figure 1b), a guide for the classification of surfaces referring the proper protection for each, according to the respective rules, and “Surface Protection Guide for Steelwork exposed to Atmospheric Environments” (Figure 1c). TC 4 suspended its activities at the end of the twentieth century, under the chairmanship of Mr. P. Quaquin, from France.



a) ECCS/TC4 No. 50/1987: *Protection of Steel Structures against Corrosion by Coatings*



b) ECCS/TC3 No. 90/1998 *Surface Protection Guide for Steelwork in Building Interiors and Facades*



c) ECCS/TC4 No. 98/1998 *Surface Protection Guide for Steelwork exposed to Atmospheric Environments*

**Figure 39: TC4 relevant publications**

#### 4.2.4 Technical committee TC5 – Cad/cam

Technical committee 5 on CAD/CAM intended to help in the preparation of guidelines for software in the domain of constructional steelwork. This committee was chaired by J.B. Schleich, from Luxembourg. In this respect the aim of TC5 was to highlight the shortcomings in the existing software. One of the crucial disadvantages of that time programs was their lack of integration. Steps had to be taken in order to facilitate data exchange among separate computer programs covering different application areas. Furthermore, TC5 wished to create conditions favouring the development of software supporting Eurocode 3 “Design of steel structures” and Eurocode 4 “Design of composite structures”. These Eurocodes are unique European construction standards which represent a milestone in the framework of the European economic and political integration. A market survey of software for constructional steelwork was published in 1990 (Figure 40).

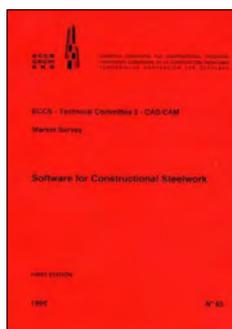


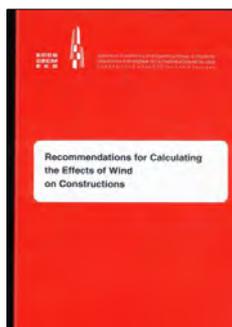
Figure 40: ECCS/TC5 No. 63/1990: *Software for Constructional Steelwork – Market Survey*

#### 4.2.5 Technical committee TC12 - Wind

Wind action on buildings and structures is of course not materially dependent and therefore not specific to steel. A correct, not exaggerated evaluation of wind loads is needed in order to avoid unnecessary over-dimensioning of structural steel members and connections. The Convention has undertaken a comprehensive study in this field, as a defence against over-estimation of wind-loads, which was an undue handicap for steel in competition with heavier materials. To this end, a Committee, in which CEB and FIP were represented, was formed under the chairmanship of the Technical General Secretary. Good liaison with the ISO group dealing with that matter was permanently kept.

The results of these studies were published in a volume of practical recommendations as a modern code for the design of structures exposed to wind effects (Figure 41). A very simple procedure of calculations has been developed for rigid structures, which represent the large majority of practical cases, and a necessarily more sophisticated one for flexible, slender ones. The Convention has thus produced a basis for a Eurocode 1 part 4 on this matter. A wind map for Western Europe has also been established, in order to suppress differences among national codes, which appeared absurd especially in the vicinity of national borders.

Along its existence, TC12 was chaired by D. Sfintesco, from France, R. D’Have, Belgium, Dr. K.J. Eaton, United Kingdom, and finally by Mr P. Spehl, Belgium (Bureau SECO). This committee stopped its activities at the end of the twentieth century.



**Figure 41: ECCS/TC12 No. 52/1987 *Recommendations for Calculating the Effects of Wind on Constructions, 2<sup>nd</sup> Edition***

#### **4.2.6 Technical committee TC14 – Structural Steelwork Erection (not active)**

At the General Meeting of the ECCS held in 1967 it was decided that there was a need for a technical committee to look into all aspects concerning the erection of steel structures. Technical Committee 14 “Structural Steelwork Erection” was therefore appointed and the first meeting was held in 1968, under the chairmanship of W.H. Arch, of Great Britain. The aim of the Committee was to develop recommendations of good practice on various matters involved in the erection of steel structures, likely to be adopted or adapted for application in the member countries of ECCS so that practice throughout these countries will be to the same high standards. Because of the need for reducing accidents on construction sites it was felt highly desirable to concentrate at first on developing a code for safety in the erection of steel structures. A publication: “Recommendations for safe working during the erection of steel structures”, was published in May 1975.

TC 14 was then chaired by D.S. Trickett, United Kingdom, and later by M. Mayrhofer, Austria. This committee also changed its name to “Quality Management” to better reflect the work performed.



**Figure 42: ECCS/TC14, May 1975: *Recommendations for safe working during the erection of steel structures***

#### **4.2.7 Technical committee TC15 – Architectural and Structural Design. Innovation, construction and emerging technologies**

The technical committee 15 (TC 15) was created in 2007 with the aim to disseminate the recent advances in the art and practice of designing and building steel structures in which the structural and architectonic values are consciously combined and the contribution of each other is mutually enhanced. The main gaps to be filled are those between the creative and scientific aspects that condition researchers and practitioners working in the conception and construction of steel structures. This committee was chaired by Prof. Paulo Cruz, from

University of Minho, Portugal, and members of this committee were experts in Structures and Architecture representing different European countries

The scope of the technical commission was encompassing, but not restricted to, innovative architectural and structural design, the use of new materials, the tectonic of new solutions, comprehension of complex forms, special structures, emerging technologies, the combination with other materials such as glass and membranes.

The objectives were, notably, to constitute a multidisciplinary forum for dissemination of practice-based information on the technical issues concerning all aspects of Architectural & Structural Design; to encompass new works, repair and maintenance of a wide range of steel structures; to harmonize construction practices with design theories; etc.... The first ICSA conference "Structures and Architecture" was organized in 2010 at the University of Minho, Guimarães, Portugal.

The TC 15 Committee was disbanded in 2014 because he was not active for several years.

## 5 Promotional Activities

Every promotion for the steel industry has to start with improving the scientific and technical foundations in order to allow the design of more economic steel structures with reduced costs and to support the fight against undue discrimination in building codes and fire protection regulations. Therefore the concern for these technical matters was always considered as basic promotional work.

### 5.1 Publications

The most obvious way to publicize the activities of the Convention is to publish the results of the research and other investigations carried out by the various Committees. Consequently a great number of publications have been issued by the Convention itself and are available at the e-store on [www.steelconstruct.com](http://www.steelconstruct.com). Proceedings of all the various conferences and symposia sponsored or co-sponsored by the Convention are also available.

In 2006, the last version of the Lexicon Software (Figure 43) was developed, and it is freely downloadable on the ECCS web site. This software contains thousands of technical terms for steelwork in Dutch, English, Finnish, French, German, Hungarian, Italian, Portuguese, Romanian, Spanish, Swedish, and Turkish.



Figure 43 : ECCS Lexicon software

### 5.2 Promotional and advisory committees

The aims of Advisory Committees are primarily to watch the market development in their respective sectors, to advise members and other Committees on necessary technical developments, to collect and formulate arguments for the use of structural steelwork for the specific type of buildings and applications. The evolution of the Advisory Committees in the history of ECCS is illustrated in chapter 3 (Table 4).

#### 5.2.1 The Bridge Committee

The "Bridge Committee" deals with developing promotion tools for the development of the market for bridges in steel in Europe. This committee promote and organize the International Conference/Symposium on Steel Bridges since 1988, as shown in Table 5. In 2015, the *8<sup>th</sup> International Symposium on Steel Bridges: Innovation & New Challenges 2015* (SBIC-2015), was organised in coordination with the Turkish Constructional Steelwork Association (TUCSA), in Istanbul, Turkey (Figure 44).

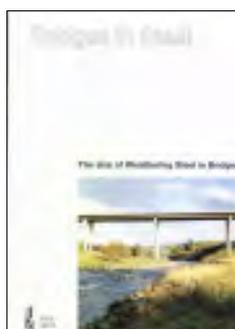
**Table 5: Historical List of International Symposiums on Steel Bridges**

Symposium	Date	Location
1 <sup>st</sup> International Symposium on Steel Bridges	25-26 Feb 1988	London, United Kingdom
2 <sup>nd</sup> International Symposium on Steel Bridges	29-30 April 1992	Paris, France
3 <sup>rd</sup> International Symposium on Steel Bridges	30 Oct-1 Nov 1996	Rotterdam, The Netherlands
4 <sup>th</sup> International Symposium on Steel Bridges	17-19 May 1999	Leipzig, Germany
5 <sup>th</sup> International Symposium on Steel Bridges	5-7 March 2003	Barcelona, Spain
6 <sup>th</sup> International Symposium on Steel Bridges	31 May-2 June 2006	Prague, Czech Republic
7 <sup>th</sup> International Conference on Steel Bridges	4-6 June 2008	Guimaraes Portugal
8 <sup>th</sup> International Symposium on Steel Bridges: Innovation & New Challenges	14-16 September 2015	Istanbul, Turkey



**Figure 44: 8<sup>th</sup> International Symposium on Steel Bridges: Innovation & New Challenges 2015 (SBIC-2015)**

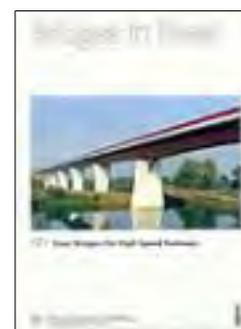
The bridge committee also develop publications on steel and composite bridges (see Figure 45).



a) N°81: *Bridges in Steel – The use of weathering steel in Bridges*



b) N°86: *Steel Bridges span Europe*



c) N°121: *Bridges in Steel - Bridges for High-Speed Railways*

**Figure 45: Relevant publications produced by the Bridge Committee**

### 5.2.2 The Awards Committee

It has been the practice among Convention members for many years to award prizes for the best entries made in competitions for architectural or civil engineering projects using steelwork and completed in the recent past. The idea was adopted by the Convention and the

initial prizes were awarded for submissions from members at the annual meeting held in Taormina in 1973, the recipients in each case being the client, the architect, the structural engineer and the fabricator. The plaque and the diplomas are presented to the prize winners either in a special ceremony at the Annual General Meeting or in a national event organized by the respective member association.

The Awards committee was created in 2013. Three Awards are frequently given to National projects: i) the European Steel Design Awards, ii) the European Student Awards for Steel Design, and iii) the Bridge Awards. All the winning projects can be consulted on our website [www.steelconstruct.com](http://www.steelconstruct.com), and the winners are listed in Appendices A.2 and A.3.

### EUROPEAN STEEL DESIGN AWARDS

Since 1997, the European Steel Design Awards (Figure 46) are given by ECCS every two years to encourage the creative and outstanding use of steel in architecture and construction in Europe. The Awards are open to steel works designed or produced in the ECCS Full Member countries. Both new buildings or bridges, and renovation projects (major retrofit, expansion or rehabilitation) are eligible. The awards are dedicated to the owner, general contractor, the architects, the engineers and the steelwork contractors of one outstanding national project per member country in order to esteem their collaboration and the excellence of their work. The national member is responsible for the evaluation and selection of the submitted project. ECCS International Jury select the projects to be awarded with the awards of merit or awards of excellence in different categories. Since 2015, three Awards of Excellence are given to the three best projects, and Figure 50 depicts the three winners of 2015.



*European Steel Design Award Plaque (until 2006)*



*European Steel Design Award Trophies (since 2007)*

**Figure 46: European Steel Design Awards**

### EUROPEAN STUDENT AWARDS

The Student Awards for Steel Design are a subcategory of European Steel Design Awards. The objective is to give European recognition to outstanding student projects in architectural design using structural steel as a prominent architectural feature. The Awards are open to all ECCS Full Member Associations, which organise contest for architectural students in their respective country.

## BRIDGE AWARDS

The objective of the Steel Bridge award (Figure 47) is to give European recognition to outstanding steel and composite bridges emphasizing the many advantages of steel in construction, production, economy and architecture. The awards are opened to steel and composite bridges which steel structures were fabricated in the ECCS full members' countries. The construction must have been completed and be ready for use within the last three years. Bridges, footbridges and renovation projects (major retrofit, expansion or rehabilitation) are eligible. Bridge awards were distributed in 2008 (Guimarães), 2010 (Istanbul), 2012 (Lisbon), and the next one will be held in 2016 in Stockholm.



**Figure 47: European Steel Bridge Award**

Other types of rewarding remitted by ECCS: the Charles Massonnet Award and the Silver Medal.

## CHARLES MASSONNET AWARD

Professor Charles Massonnet was an eminent expert and academic, but also one of the most leading personality's members of ECCS who contributed to the promotion of the use of steel in construction through his work and his tuition in stability, plasticity and strength of materials. In principle every year, a **Charles Massonnet Award** (Figure 48) is given to a prominent scientist who contributed by his/her works within ECCS to the development of steel works. This Award was created by Robert Salkin, General Secretary of the Convention from 1995 to 2001. The nominated person is proposed to the executive board by the nomination committee and is submitted to the vote at the spring meeting of the Executive Board at a simple majority of the members present. The Members of the Board and the official(s) of ECCS are not eligible for the award during the time of their office. The list of all the Charles Massonnet Awards since 1998 is detailed in Appendix A.4.



**Figure 48: Charles Massonnet Award**

## THE SILVER MEDAL

The **ECCS Silver Medal** is the highest decoration in ECCS. It is reserved to personalities who have rendered extraordinary services to the European Association. With this medal, ECCS has been honouring outstanding personalities since 1964 (Figure 49); the list of honoured personalities is in Appendix A.5.



**Figure 49: ECCS Silver Medal**



a) *Troja Bridge*  
Prague,  
Czech  
Republic



b) *The Canopy, La Canopée des Halles*  
Paris,  
France



c) *Arena Amazonia*  
Manaus,  
Brazil  
(from  
Portugal)

Figure 50: European Steel Design Awards 2015 – Awards of Excellence

### 5.3 The ECCS Academy

The ECCS Academy has been created to promote education in steel construction for architects, engineers and technicians in coordination with the ECCS Full Members, and to encourage initiatives on training/attracting highly skilled educated people and retaining them in the steel industry.

In 2015, the ECCS Academy is still under development; however the rules to organise an ECCS training course are well defined in the Quality Manual and some courses have already been organised in Norway, Turkey and Portugal, based on the Eurocode design manuals published by ECCS and mentioned in chapter 4.

The ECCS Academy ensures that the activities are performed to the benefit of the steel construction industry in order to disseminate steel structure related knowledge, to meet with the training requirements of sector players, and to support the extensively use of steel. The aims of the activities are:

- To provide complementary architectural and engineering steel structures knowledge through seminars, course and/or certificate programmes which are included in education program of universities and equivalent schools.
- To update structural steelwork knowledge of architects and engineers, such as new standards, recent technological developments, etc.
- To contribute to the standardisation of constructional steelwork trainings and educations for relevant architects and engineers.
- To increase the income of ECCS and the organising to support their activities.

More information can be found on [www.steelconstruct.com](http://www.steelconstruct.com).

## 6 The future of the Eurocodes

### 6.1 Background of the Eurocodes

In 1975, the Commission of the European Community launched an action programme in the field of construction, with the objective to eliminate technical obstacles to trade and harmonize technical specifications. Within this action programme, the Commission took the initiative to establish a set of harmonized technical rules for the design of construction works with the final objective to replace the national rules in force in the Member States. For fifteen years, the Commission, with the help of a Steering Committee with Representatives of Member States, conducted the development of the Eurocodes programme, which led to the first generation of European codes in the 1980s.

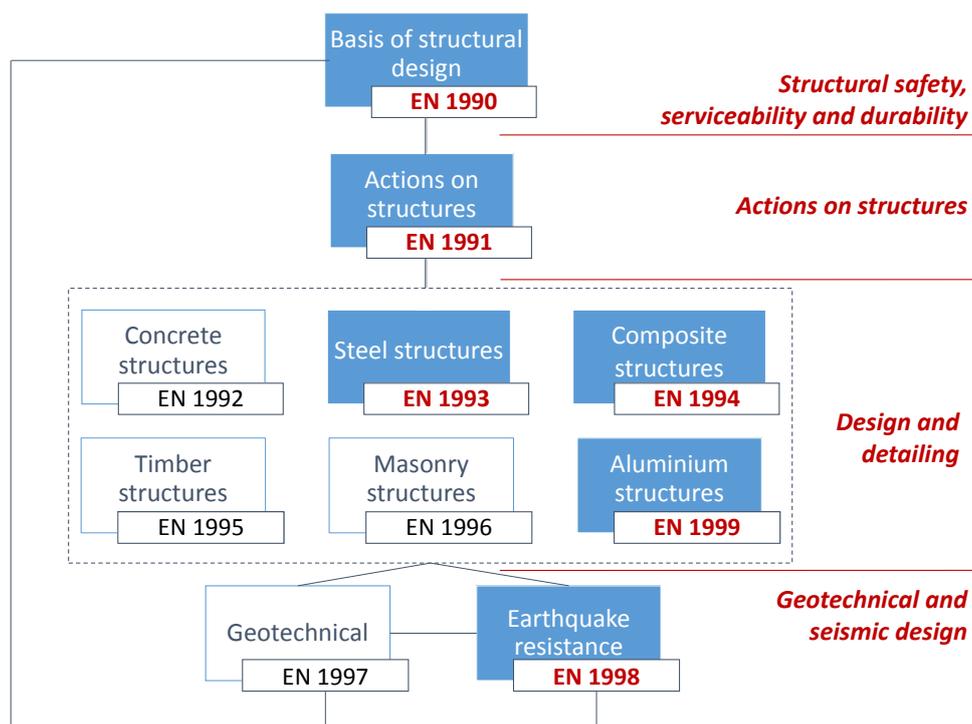
In 1989, the Commission and the Member States of the EU and EFTA decided, on the basis of an agreement between the Commission and CEN (European Committee for Standardization), to transfer the preparation and the publication of the Eurocodes to the CEN through a series of Mandates, in order to provide them with a future status of European Standard (EN).



EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN brings together the National Standards Bodies of 33 countries including all of the EU member states plus 3 EFTA countries (Iceland, Norway and Switzerland) and 2 EU candidate countries (Turkey and the former Yugoslav Republic of Macedonia). European Standards (ENs) that have been adopted by CEN are accepted and published in all of these countries.

Nowadays, the Structural Eurocodes comprise 10 Standards and 58 Parts. These Eurocode standards, shown on Figure 51, provide common structural design rules for everyday use for the design of whole structures and component products of both a traditional and an innovative nature. Unusual forms of construction or design conditions are not specifically covered and additional expert consideration will be required by the designer in such cases.



**Figure 51: The ten Standards for technical and geotechnical design; the five Eurocodes in relation to steel, aluminium or composite steel-concrete structures are highlighted in blue.**

## 6.2 New generation of Eurocodes in preparation

In 2015, a six year programme of work, supported by the European Commission, has been launched to develop the next generation of European standards for structural and geotechnical design. The new Standards are expected to be published in 2020 and will embrace new technologies and market needs, extending the scope of the existing Structural Eurocodes suite (EN 1990 – EN 1999).

The objectives of this new generation of Eurocodes are:

- To reduce the Nationally Determined Parameters (NPDs) of existing Eurocode parts;
- To enhance ‘ease of use’ of existing Eurocodes by:
  - improving the clarity;
  - simplifying routes through the Eurocodes;
  - limiting, where possible, the inclusion of alternative application rules; and
  - avoiding or removing rules of little practical use in design;
- So that Modern Eurocodes are provided, with the necessary basis for complex problems, and easy-to-use rules for standard cases (80%);
- To create new Eurocodes, e.g. for “Glass” or “Existing Structures”.

These Eurocodes development should:

- Encourage innovation
- Take into account new societal demands and needs
- Facilitate the harmonisation of national technical initiatives on new topics of interest for the construction sector
- Enhance user-friendliness

### 6.3 Links between Eurocodes and ECCS Technical Committees

Several ECCS committees have constantly been the main expert groups for some subcommittees of CEN since the first version of Eurocodes. All these standards for which ECCS has contributed are highlighted in blue in Figure 51, and relations between standards and technical committees (TC) are depicted in Table 1.

**Table 6: Relations between standards and technical committees**

<b>Standards</b>	<b>Related ECCS technical committees</b>
<b>EN 1990</b>	*TC 1 (Structural safety)
	*TC 1 (Structural safety)
<b>EN 1991</b>	TC 3 (Fire safety) *TC 12 (Wind)
	TC 3 (Fire safety) TC 6 (Fatigue and fracture)
<b>EN 1993</b>	TC 7 (Cold-formed thin walled sheet steel in buildings) TC 8 (Structural stability) TC 10 (Structural connections)
<b>EN 1994</b>	TC 3 (Fire safety) TC 11 (Composite structures)
<b>EN 1998</b>	TC 13 (Seismic design)
<b>EN 1999</b>	*TC 2 (Aluminium alloy structures)

*\*TC: Committee provisionally disbanded*

Some committees meetings (e.g. TC 3 or TC6) are held together with those of the respective CEN Working Groups. In that light, the majority of the background work for the evolution of these parts of the steel Eurocode is being done within the committee and therefore ECCS which brings the latter an added value for its members.

The role of the technical committees of ECCS in the new generation of Eurocodes is the systematic review, with general revision and maintenance.



## 7 Which strategies for a better use of steel in construction in Europe

### 7.1 Point of view from the Steel Industry

As a steel producer we would see the following opportunities to be strongly pursued in the next 5 to 10 years:

- Making **high-strength steel grade (S355)** to become the regular grade in Europe for structural sections. This would considerably contribute to improve the competitive position against reinforced concrete, -- and support to gain market shares of steel in construction in Europe. In some countries, such as UK and some Nordic countries, this transition has already occurred in recent years.
- Widen the use of **very high-strength steel (S460)** and create super high-strength steels for structural sections, such as (S500, S550, S600, ...). In general, higher performance steels will support to keep up with the development of ultra-high performance concrete.
- Improve the development and maintenance of **standards and regulation** to facilitate sufficiently quickly the implementation of new steel grades and constructive solutions in the European market place.
- To maintain the **safety of steel construction** by keeping the European quality conformance level of European steel producers and steel fabricators (CE-marking) thoroughly assessed.
- To better consider the **recyclability of steel** in environmental assessments standardizations and regulations.
- **Optimisation of the structural system** and **combination between different materials** (high-strength steels with high strength concrete).
- **To re-engineer buildings** having them fully adaptable and extendable. This re-thinking of the modern architecture will be fostered by the use of full **BIM Models** allowing a complete understanding of the structures and all the elements forming the building object.
- **Making steel more “understandable” and approachable** by the architects and the stakeholders. This can be done by standardisation and deep teaching of steel structures and façades.

*July 2015, ArcelorMittal Luxembourg.*

### 7.2 Point of view of an Academic

If we talk about future needs for a better use of steel in European construction then first of all the process chain should be considered:

*(1) Preproduct - (2) Design - (3) Manufacturing and Erection - (4) Endproduct*

Each stage of the process chain need to be further developed and researched.

- (1) Structural Steels with high or even ultra-high strength and at the same time sufficient ductility, toughness and workability, together with a highly diversified variety of half products ensuring a high degree of geometrical and material tolerance control that is necessary for a modern design, safety approach and production.

- (2) Improvement of design both for ULS and SLS by intensive research allowing for a better prediction of the structural behaviour, imperfections, material behaviour, safety and - very important - for the development of integrative solutions. Apart of these aspects, in future the design codes need to be developed towards
  - ease of use for daily design
  - exploitation of numerical and computational capabilities
  - integral design beginning from early planning up to manufacturing and erection, linking with the methodologies of BIM
- (3) Manufacturing should take benefit of the developments and improvements of computer assistance, the use of new HSS materials as well as integrative solutions.
- (4) Sustainable products that benefit from integral approaches ensuring future markets.

However, aforementioned aspects need to be considered under economic and ecologic conditions.

Overarching tasks for academics reach from education of students over influencing engineers to steel minded thinking to merging architects and clients to steel oriented planning.

***August 2015, Professor Markus Feldmann, RWTH Aachen, Germany.***

## 8 ECCS' 60<sup>th</sup> Anniversary in Istanbul

In September 2015 the ECCS celebrated the 60<sup>th</sup> anniversary of the European Association. A speech and a special ceremony took place during the Gala Dinner on 15<sup>th</sup> September 2015 in Adile Sultan Palace, Istanbul.





*Special speech for the 60<sup>th</sup> anniversary, by Mrs. Véronique Dehan, ECCS General Secretary*

The Secretary General of ECCS grabbed this opportunity to thank the past collaborators, Presidents, Chairmen, Secretaries General, members who, like many others, did contribute to the cause of constructional steelworks.

Two of them were present that evening to celebrate this event: Mr Robert Salkin, Secretary General of ECCS from 1995 to 2001 and Dr. Volkmar Bergmann, Chairman of the ECCS Board from 2007 to 2013. They were rewarded with a plaque in recognition for the services rendered to ECCS.



*Mr Robert Salkin, Secretary General of ECCS from 1995 to 2001*



*Dr. Volkmar Bergmann, Chairman of the ECCS Board from 2007 to 2013*



*On the occasion of the 60<sup>th</sup> anniversary of ECCS, the ECCS full members received a box of the best Belgian chocolate!!*

## Acknowledgments

Those who have participated in the publication are gratefully acknowledged: Véronique Dehan, ECCS General Secretary; Cécile Haremza, ECCS Technical Secretary; Prof. Paulo Vila Real, chair of TC3; Mr. Mladen Lukic, chair of TC6; Prof. Jörg Lange, chair of TC7; Prof. Bert Snijder, chair of TC8; Prof. Joachim Lindner, former chair of TC8; Dr. Roger Pope, former chair of TC9; Mr. Kjetil Myhre, chair of TC9; Prof. Thomas Ummenhofer, chair of TC10; Prof. Riccardo Zandonini, chair of TC11; Prof. Raffaele Landolfo, chair of TC13; Prof. Luís Bragança, chair of TC14; Prof. Peter Schaumann, chair of TC16; Mr. Yener Gur'es, ECCS PMB chairman; Mr. Jacques Van Neste; Mr. and Mrs. Robert and Mireille Salkin; Prof. Markus Feldmann, RWTH Aachen; Mr. Georges Axmann and Prof. Olivier Vassart, ArcelorMittal Luxembourg; Mrs. Isabela Zangrando, Unicmi, Italy; Mr. Jean-Louis Gauliard, SCMF, France; Dr. David Moore, BCSA, UK; Mr. Richard Barrett, UK; Mr. Mehmet Okutan, photographer; and finally, to our President 2014-2015, Prof. Nesrin Yardimci.



## APPENDIX

## A.1 Chairmen and venues of annual general meetings

	1957	C.F. KOLLBRUNNER	Zürich, Switzerland
	1958	P. LORIN	Paris, France
	1959	K. VON OSWALD	Hamburg, Germany
	1960	C. ISAAC	Knokke-le-Zoute, Belgium
	1961	P. GOETZ	Vienna, Austria
	1962	L. FINZI	Venice, Italy
	1963	A. de VRIES ROBBÉ	Amsterdam, The Netherlands
	1964	J.M. GARCIA Y GARCIA	Madrid, Spain
	1965	T.S. GIBSON	Torquay, England
	1966	O. VERZIJK	Dubrovnik, Yugoslavia
	1967	S. BAHRKE	Saltsjöbaden, Sweden
	1968	C.F. KOLLBRUNNER	Locarno, Switzerland
	1969	C. BEAU	Cannes, France
	1970	K. VON OSWALD	Dusseldorf, Germany
	1971	R. CHARON	Brussels, Belgium
	1972	H. SCHÖN	Graz, Austria
	1973	G. MAGENTA	Taormina, Italy
	1974	A. VAN AALST	Den Haag, The Netherlands
	1975	J.M. BARANDA	Torremolinos, Spain
	1976	J.A. HUMPHRYES	Gleneagles, Scotland
	1977	B. ZARIC	Dubrovnik, Yugoslavia

	1978	L. RISCA	Helsinki, Finland
	1979	U. GEILINGER	Montreux, Switzerland
	1980	E.J. THRANE	Sandefjord, Norway
	1981	F. BESSON	Paris, France
	1982	S. EKBERG	Stockholm, Sweden
	1983	H.J. DANKERT	München, Germany
	1984	P. BORCHGRAEVE	Brussels, Belgium
	1985	J.B. SCHLEICH	Luxembourg, (Grand Duché)
	1986	R. HECKEL	Salzburg, Austria
	1987	G. VANNACCI	Sorrento, Italy
	1988	R.S. NICOLAAS	Scheveningen, The Netherlands
	1989	G.C. BARRETT	Stratford upon Avon, England
	1990	U. WYSS	Interlaken, Switzerland
	1991	J. GIMSING	Odense, Denmark
	1992	P. SANDBERG	Tampere, Finland
	1993	H. LIBERT	Paris, France
	1994	J.B. SCHLEICH	Luxembourg, (Grand Duché)
	1995	W. BÄRSCH	Köln, Germany
	1996	W. HOECKMAN	Brussels, Belgium
	1997	H. MASSICZEK	Innsbruck, Austria
	1998	B. AASEN	Bergen, Norway
	1999	J. LOCKE	London, England
	2000	T.S. ARDA	Istanbul, Turkey
	2001	A. VINTANI	Venice, Italy

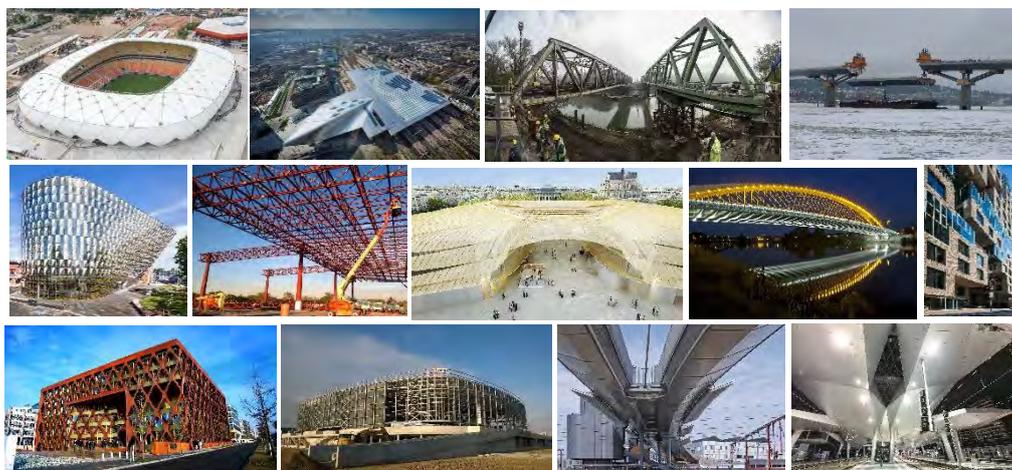
	2002	J. ANDERSON	Stockholm, Sweden
	2003	K. MEYER	Lucerne, Switzerland
	2004	C. REMEC	Ljubljana, Slovenia
	2005	J. HUILLARD	Nice, France
	2006	D. DUBINA	Poiana Brasov, Romania
	2007	B. THERET	Kirchberg, Luxembourg
	2008	E. BRAATHU	Aalesund, Norway
	2009	J. DELRIÚ	Barcelona, Spain
	2010	N. YARDIMCI	Istanbul, Turkey
	2011	R. LUTHER	Potsdam, Germany
	2012	Luís SIMÕES DA SILVA	Lisboa, Portugal
	2013	Luís SIMÕES DA SILVA Marco PERAZZI	Milano, Italy
	2014	Raffaele LANDOLFO	Naples, Italy
	2015	Nesrin YARDIMCI	Istanbul, Turkey



**Figure 52: Nesrin Yardimci,  
ECCS President 2014-2015**



## A.2 Winners of the ECCS European Steel Design Awards



**Figure 53: European Steel Design Awards 2015**

### 1997, Innsbruck, Austria

- AUSTRIA District Plant Vienna south
- BELGIUM Reconstruction of the "Kronprinzenbrücke", Berlin
- DENMARK "Rotunden", Tuborg nord, Copenhagen
- FINLAND Landscape 2000 cybernetics, Karkkila
- FRANCE Bridge Charles de Gaulle, Paris
- GERMANY Cycling hall, Berlin
- ITALY Elevated Heliport Structures of the new Lingotto, Torino
- NETHERLANDS Centre for Human Drug Research in Leiden
- NORWAY Trondheim Airport Vaenes, Terminal A
- ROMANIA Hybrid tensioned membrane for a market in Timisoara
- SWEDEN Gothenburg central - Nils Ericsson Terminal, Göteborg
- SWITZERLAND Three Countries' corner, Basel
- TURKEY Bati tourism centre project, Istanbul
- UNITED KINGDOM "White rose" shopping centre, Leeds

### 1999, London, England

- AUSTRIA Reichstag, new German parliament, Berlin, Germany
- BELGIUM La Garde-Adhémar bridge, Spanning the Donzère-Mondragon Canal, Pierrelatte, France
- CZECH REPUBLIC Mariánský Bridge, Usti nad Labem
- DENMARK The East bridge, Storebælt
- FRANCE Terminal 2F, Roissy
- GERMANY Shipyard Building Volkswerft, Stralsund
- ITALY New exhibition center Hall 19-20 in the Bologna exhibition centre
- LUXEMBOURG City centre of Kirchberg, Luxembourg
- NETHERLANDS Storm Surge barrier on the waterweg, located between the towns of Hoek van Holland and Maassluis

NORWAY	Protective structure for Hamar Cathedral ruins
SLOVENIA	Bridge for Pedestrians and cyclists across the river Drava, Ptuj
SWEDEN	Aula Magna, Stockholm
SWITZERLAND	Lucerne culture and convention centre
TURKEY	The Sabanci Convention and Exhibition Centre, Antalya
UNITED KINGDOM	New Millennium Experience, London

## 2001, Venice, Italy

AUSTRIA	UFA cinema centre, Dresden, Germany
BELGIUM	Pont de l'Europe • Orléans, France
CZECH REPUBLIC	Administration centre of the South Moravian, Gasworks, Brno
DENMARK	The Øresund Bridge • Øresund
FINLAND	Itamerentori Office Building (Baltic Sea Tower), Helsinki
FRANCE	Middle School "André Maurois", Limoges
GERMANY	CargoLifter Shipyard, Brand (Berlin)
ITALY	World Distribution and managing Center Safilo, Group S.p.A.
NETHERLANDS	The British Airways London Eye • London, UK
NORWAY	Airport train terminal at Oslo S, Oslo
SLOVENIA	Home of Economy. Office Building of the Chamber of Commerce and Industry of Slovenia (CCIS)
SWEDEN	Infra City Business Center, Upplands Väsby
SWITZERLAND	Messe Basel, Halle 1
TURKEY	Istanbul-Sabiha Gökçen Airport – International Terminal, Istanbul
UNITED KINGDOM	Central park - block E, Dublin

## 2003, Lucerne, Switzerland

AUSTRIA	Atrium Roof of the Great Court, British Museum, London, UK
BELGIUM	Swiss Re London Headquarters Building, London, UK
DENMARK	Covering of Parken, Copenhagen
FINLAND	High Tech Center Helsinki, Helsinki
FRANCE	Gare TGV d'Aix-en-Provence
GERMANY	Hot Dip Galvanizing Line, Dortmund
HUNGARY	Covering of the UTE Stadium's Grandstand, Budapest
ITALY	Chavanon Viaduct, Motorway A89, France
LUXEMBOURG	Chambre du commerce de Luxembourg
NETHERLANDS	ING-House, Amsterdam
NORWAY	Mortensrud Church, Oslo
ROMANIA	Bank Post Timisoara
SLOVENIA	Shopping Center Mercator, Nova Gorica
SWEDEN	Bridge Apatê, Stockholm
SWITZERLAND	Roof of the University of Zurich
TURKEY	Automatic Carpark Building (Milli Reasurans Tas Multistorey), Istanbul
UNITED KINGDOM	The Boxworks, Manchester

## 2005, Nice, France

AUSTRIA	Air traffic control tower, Vienna Airport
BELGIUM	Three bridges over the Hoofdvaart Haarlemmermeer
CZECH REPUBLIC	Sazka Arena, Prague
DENMARK	Flintholm Station, Vanløse
FINLAND	TKP Finnmap Offices, Helsinki
FRANCE	Millau Viaduct
GERMANY	Munich International Airport Terminal 2
ITALY	Olympic Stadium "OAKA", Athens
LUXEMBOURG	Grande-Duchesse Joséphine-Charlotte Concert, Hall, Luxembourg
NETHERLANDS	Hoge Bridge, Maastricht
NORWAY	V-House, Nesya
PORTUGAL	Estadio do Dragao - Rooftop, Porto
ROMANIA	Charles De Gaulle Plaza Building, Bucharest
SLOVAKIA	Kosicka Bridge, Bratislava
SLOVENIA	TZC Portoval - Amusement, Commercial and Business Centre, Novo Mesto
SPAIN	Campis Elisis - Footbridge on the Segre River, Lleida
SWEDEN	Mjärdevi Center, Linköping
SWITZERLAND	"La Ferriera" building, Locarno
TURKEY	Dolapdere campus second building of Istanbul Bilgi University, Istanbul
UNITED KINGDOM	The Wales Millennium Centre, Cardiff

## 2007, Kirchberg, Luxembourg

AUSTRIA	Zlote Tarasy atriumroof, Warsaw (Poland)
BELGIUM	Gustave-Flaubert bridge, Rouen (France)
CZECH REPUBLIC	Pedestrian bridge across D8 highway
DENMARK	Fiberline Composites factory, Fuen
FINLAND	Kamppi Centre, Helsinki
FRANCE	Simone-de-Beauvoir footbridge, Paris
GERMANY	Multi-storey car park across A8 motorway, Stuttgart
ITALY	Oval" Olympic speed ice skating arena, Turin
LUXEMBOURG	Centennial Pavilion, Esch-sur-Alzette
NETHERLANDS	WKK energy plant, de Uithof-Utrecht
NORWAY	Papirbredden, Drammen
PORTUGAL	Francisco Sa Carneiro Airport
ROMANIA	Tower Center International, Bucharest
SLOVENIA	TRIP or Trimo Research
SPAIN	New terminal area of Madrid-Barajas airport
SWEDEN	Floating roof, Vällingby Centre, Stockholm
SWITZERLAND	Center Paul Klee, Bern
TURKEY	Izmir Adnan Menderes Airport International
UNITED KINGDOM	Terminal and car park Royal Air Force Museum, Cosford

## 2009, Barcelona, Spain

AUSTRIA	Neue Mitte Lehen, Salzburg
BELGIUM	Leuven Railway Station, Leuven
CZECH REPUBLIC	Strizkov Subway station, Prague
DENMARK	Concerthuset, Copenhagen
FRANCE	Terminal 2E, Charles-de-Gaulle Airport • Roissy (Paris)
GERMANY	Klimahaus® Bremerhaven 8° Ost
ITALY	Three bridges in Reggio Emilia
LUXEMBOURG	European Court of Justice, Luxembourg
NETHERLANDS	Kraanspoor Office Building, Amsterdam
NORWAY	Ypsilon Footbridge, Drammen
PORTUGAL	Bascule Bridge, Leixões
ROMANIA	Business Park, Brasov
SLOVENIA	Football stadium, Maribor
SPAIN	Media-TIC Building, Barcelona
SWEDEN	Swedbank Stadion, Malmö
SWITZERLAND	Letzigrund Stadium, Zürich
TURKEY	Greengrocers and fishmongers market, Bursa
UNITED KINGDOM	Wimbledon Centre Court, Wimbledon

## 2011, Potsdam, Germany

AUSTRIA	Baku Tollgate, Baku, Azerbaijan
CZECH REPUBLIC	Arena Chomutov, Chomutov
DENMARK	The Crystal, Copenhagen
FRANCE	Basalte Building, Paris La Défense
GERMANY	Formula I Race Track, Yas Marina Circuit, Abu Dhabi, United Arab Emirates
HUNGARY	Terminal Sky Court of Ferenc Liszt International Airport, Budapest
ITALY	Aviva Stadion, Dublin, Ireland
LUXEMBOURG	Les Rives de Clausen Office Building, Luxembourg
NORWAY	Holmenkollen K120 ski jump arena, Oslo
PORTUGAL	Dolce Vita Tejo, Amadora
ROMANIA	Otopeni International Airport Development, Bucharest
SPAIN	Sant Josep Building Refurbishment, Vall de Nuria (Girona)
SWEDEN	Discfilter Building, Gothenburg
SWITZERLAND	School in Leutschenbach, Zürich
TURKEY	Sabiha Gökçen International Airport-The New Terminal Building, Istanbul

## 2013, Milano, Italy

AUSTRIA	Central Railway Station Salzburg
CZECH REPUBLIC	Bridge across the Lochkov Valley, Prague
FRANCE	Stade de Lille, Lille France
GERMANY	Bharati, New Indian Research Station, Larsemann Hills, Antarctica
ITALY	New High Speed Railway Station, Turin Porta Susa, Turin, Italy

- LUXEMBOURG CCK Centre de Conférence Kirchberg, Luxembourg Kirchberg  
NETHERLANDS Platform canopies and Pedestrian bridge, Arnhem Central Station, Arnhem The Netherlands  
NORWAY Trollstigen National Tourist Route, Trollstigen – Tourist Route  
PORTUGAL Arena Fonte Nova Stadium, Salvador da Baia, Brazil  
SWEDEN The Tullhus Bridge, Norrköping, Sweden  
SWITZERLAND Bridge Hans Wilsdorf, Geneva  
TURKEY Steel Radar Towers, Izmit Turkey

## 2015, Istanbul, Turkey

### *Awards of Excellence*

- CZECH REPUBLIC Troja Bridge, Prague  
FRANCE The Canopy, La Canopée des Halles, Paris  
PORTUGAL Arena Amazonia, Manaus, Estado do Amazonas, Brazil

### *Awards of Merit*

- AUSTRIA Central Railway Station - Diamond Shaped Roof, Vienna  
DENMARK Odense Foot and Cycle Bridge, Odense  
GERMANY Sundsvall E4 Bridge, Sweden  
HUNGARY Renewal of Szolnok Railway Bridge, Szolnok  
ITALY Aquae Exposition Pavillion, Mestre  
LUXEMBOURG Office Building KPMG, Luxembourg  
NETHERLANDS New Rotterdam Central Station, Rotterdam  
NORWAY DNB HOUSE A, Oslo  
SWEDEN Aula Medica, Solna, Stockholm  
TURKEY KAYALAR CHEMICALS Administration and R&D Building, Tuzla/Istanbul

### *Students Awards*

- GERMANY **TURMTÄNZER [CLIMBING AT THE HARBOUR OF MÜNSTER]**  
Lea-Anna Zora, Anne-Sophie Weißhuhn | Prof. Dipl.-Ing. Johannes Schilling, msa | Münster school of architecture
- ITALY **A new cycle track and footpath along the banks of the Arno in Pisa: from history to design, Pisa**  
Dr. Ing. Filippo Ulivieri (Capraia e Limite (FI) - ITALY) | Prof. ing. Pietro Croce, prof. arch. Pietro Ruschi, dr. ing. Daniele Pellegrini | Università degli Studi di Pisa, Facoltà di Ingegneria
- NETHERLANDS **High Strength steel, a slimming product?**  
Ing. G. (Gerwin) Schut / G. (Gerwin) Schut BSc | Education Hogeschool Utrecht: Mr. Olaf Verschuren | Movares (Utrecht): Mr. Mark van der Heijde
- NORWAY **Through the Forest of Columns, Bergen, Norway**  
Gudrun Jona Arinbjarnardottir
- TURKEY **Modular disaster dwells**  
Senol Keskin | Bogazici University; Burcak Sonmez, Oguzhan Aydin, Sinan Tuncer, Yucel Demir | Yildiz Technical University



## A.3 Winners of the ECCS European Bridge Awards



Figure 54: Some bridges awarded

### 2008, Guimarães, Portugal

#### *Road, highway and railway bridges*

Certificate of excellence	Gustave Flaubert Lifting Bridge, Rouen (France)
Certificate of merit	Extending the lifespan of the Luis I Bridge (Portugal)
Certificate of merit	Fabian Way Bridge (United Kingdom)
Certificate of merit	Viaduct of Monestier de Clermont (France, 2006)
Certificate of nomination	Arroyo Las Piedras Viaduct (Spain)
Certificate of nomination	Viaduct St. Kilian (Germany)

#### *Pedestrian and cycle bridges*

Certificate of excellence	Tri-Countries Bridge (Germany, Baden-Wurttemberg / France, Nord-Est)
Certificate of merit	Nescioburg Cycle Bridge (The Netherlands)
Certificate of nomination	Footbridge Ypsilon (Norway)

### 2010, Istanbul, Turkey

#### *Road, highway and railway bridges*

Award	Ravine Fontaine viaduct, Reunion Island (France, 2009)
Certificate of merit	Lange Brücke Postdam (bridge across the Havel), Stadt Potsdam (Germany, 2009)

#### *Pedestrian and cycle bridges*

Award	Footbridge Over the "Rhein-Herne-Channel" in Gelsenkirchen (Germany, 2009)
Certificate of merit	Bremerhaven Glazed Pedestrian Swing Bridge, Bremerhaven (Germany, 2009)

***Bridge refurbishment***

Award New life for an old historical steel bridge over the Mures River in Savarsin (Romania, 2008)

**2012, Lisbon, Portugal**

***Road, highway and railway bridges***

Award Margaret Hunt Hill Bridge (USA/Italy)  
Certificate of merit Confluence Bridge over the river Maine (France)  
Certificate of merit Savoureuse Viaduct (France)

***Pedestrian and cycle bridges***

Award Akrobaten Bridge (Norway)  
Certificate of merit Bridge sculpture "Slinky springs to fame" (Germany)

***Bridge refurbishment***

Award Refurbishment of the Margit Bridge (Hungary)  
Certificate of merit Locket Bridge on R6 Road in Nové Sedlo (Czech Republic)

## A.4 Charles Massonnet Awards



**Figure 55 : Picture of Charles Massonnet**

1998	Prof. René MAQUOI	Belgium
1999	Prof. Jan W.B. STARK	The Netherlands
2000	Prof. Jacques BROZZETTI	France
2001	Prof. Federico MAZZOLANI	Italy
2002	Prof. Patrick J. DOWLING	United Kingdom
2003	Prof. Gerhard SEDLACEK	Germany
2005	Prof. Giulio BALLIO	Italy
2006	Prof. Manfred HIRT	Switzerland
2007	Prof. Jean-Baptiste SCHLEICH	Luxembourg
2009	Prof. David NETHERCOT	United Kingdom
2010	Prof. Carlo URBANO	Italy
2011	Prof. Bernt JOHANSSON	Sweden
2012	Prof. Reidar BJORHOVDE	USA
2013	Dr.-Ing. Joachim LINDER	Germany
2014	Prof. Jean-Pierre MUZEAU	France
2015	Prof. Franz BIJLAARD	The Netherlands



## A.5 Silver Medals



Figure 56: ECCS Silver Medal

1964	C. GRAY	Great Britain
	W. WOLF	Germany
1967	J. DUTHEIL	France
1969	M. BAESCHLIN	Switzerland
1970	C. BEAU	France
1970	H. BEER	Austria
1970	A. VAN DOUWEN	Netherlands
1972	K. VON OSWALD	Germany
1973	C. MAMUZIO	Italy
1975	R. BAEHRE	Germany
1975	F. REINITZHUBER	Austria
1977	P. STEBLER	Switzerland
1978	L. FINZI	Italy
1978	P. LORIN	France
1979	D. SFINTESCO	France
1981	H. B. EVERS	Netherlands
1981	Ch. MASSONNET	Belgium
1982	E. BRIAN	Great Britain
1983	J. A. HUMPHRYES	Great Britain
1983	H. SONTAG	Germany
1984	L. WALLIN	Sweden
1985	F. BESSON	France
1985	J. WITTEVEEN	Netherlands
1987	E. GIANGRECO	Italy
1988	E. J. THRANE	Norway

1988	D. VANDEPITTE	Belgium
1988	P. DUBAS	Switzerland
1989	U. GEILINGER	Switzerland
1991	L. WAHL	France
1991	M. LAW	United Kingdom
1993	K. KUNERT	Germany
1994	HUBER	Switzerland
1995	G. BARRETT	United Kingdom
1995	J. VANNESTE	Belgium
1996	B. LATTER	United Kingdom
1996	K. SCHMIEDEL	Germany
2001	H. LIBERT	France
2001	R. SALKIN	Belgium
2002	E. PIRAPREZ	Belgium
2002	G. VALTINAT	Germany
2003	Joe LOCKE	United Kingdom
2003	B. NIELSEN	Denmark
2004	T. KONNO	Japan
2004	U. WYSS	Switzerland
2004	G. STOLK	Netherlands
2006	A. COLLINS	United Kingdom
2009	J. LINDNER	Germany
2012	F. BIJLAARD	Netherlands
2013	Luís SIMÕES DA SILVA	Portugal
2015	Nesrin YARDIMCI	Turkey

All the publications presented in this document can be consulted on our website  
[www.steelconstruct.com](http://www.steelconstruct.com)

The ECCS was inaugurated on 17th October 1955 in Zürich and at that time, it was a Convention signed between Austria, Belgium, France, Germany, Italy, The Netherlands, Spain and Switzerland. When United Kingdom joined the Convention in 1958, the three European languages English, French and German were used for every communication. In 1978, it was decided that all future Annual Meetings would be conducted in English and this has been maintained until now. At the end of the Second World War, steel was so scarce that most government's decreed that most readily available materials such as reinforced concrete had to be used within the Reconstruction Programme priorities. This is why when steel become more available, the new generations of structural engineers and architects had very little experience in the design and erection of structural steelwork and the cement and concrete industries had taken the opportunity to impose themselves. This is how the Convention was created to redress the balance towards structural steel works. It then became the ideal platform for the promotion and research of the European Constructional Steelwork industry and paved the way of the present-day codes and standards through the creation of Technical Committees of experts, fathers of the so called European Recommendations. This passionate history of the Convention which was created in parallel with the European Community for Coal and Steel is told in this publication, the History and Achievements of ECCS (1955-2015), on the occasion of the Gala Dinner of the Convention which was held on 15 September 2015 in Istanbul.



EUROPEAN CONVENTION FOR CONSTRUCTIONAL STEELWORK  
CONVENTION EUROPÉENNE DE LA CONSTRUCTION MÉTALLIQUE  
EUROPÄISCHE KONVENTION FÜR STAHLBAU

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The European Convention for Constructional Steelwork (ECCS) is an international federation of national associations representing the steel fabrication industry in their respective countries. The aim of ECCS is to promote the use of steelwork in the construction sector by the development of standards and promotional information. It also helps to influence decision makers through the management of working committees, publications, conferences, and by active representation on European and International Committees dealing with standardization, research and development and education. ECCS brings together the steel industry, the fabrication and contracting specialists, and the academic world through an international network of construction representatives, steel producers, and technical centres. ECCS also includes non-European associations as international members, professional international organizations as associate members, and representatives of upstream or downstream products or activities as supporting members. Its General Secretariat is located in Brussels.