IABSE - Finnish Group
International Association for Bridge and Structural Engineering

Final Program

IABSE Summit 2016

Global Risks in Structural Engineering

10-11 March 2016

Helsinki - Barcelona

Finland - Spain

Finnish Association of Civil Engineers

Organizers

Dr. Prof. Risto Kiviluoma

Chair of the Finnish Group of IABSE

Mr. Atte Mikkonen

Secretary of the Finnish Group of IABSE

The Finnish Group of IABSE is more than sixty years old and one of the oldest national groups inside the IABSE organization. The Finnish Group organised the 1988 Symposium in Helsinki, the 2001 Conference in Lahti, the 2008 Conference in Helsinki, the Workshops 2013 & 2015 in Helsinki and the 2014 Summit in Helsinki. Read more about IABSE from IABSE: www.iabse.org.

Finnish Association of Civil Engineers RIL

Ms. Anu Karvonen

Director, Products and Services

Mr. Ville Raasakka

Congress Secretary, International Conferences

Finnish Association of Civil Engineers (RIL) is an organization for civil engineers with Master of Science degrees and university students of civil engineering. RIL supports the development of building, urban planning and environmental technology and acts to preserve solid and durable building and maintenance traditions. RIL also supervises the benefits of its members and promotes their professional skills and welfare. Read more from: www.ril.fi.

Introduction and welcome

The world is changing fast, and so appears to change the origin and character of the risks in structural engineering. We have today more knowledge and computing power than ever to realise, simulate and visualise our designs and constructions, as well as to monitor their optimal usage and maintenance. We have recognized well several megatrends like climate change, urbanisation, pollution and threats of terrorist attacks. We are ready to design our structures for bigger floods, tsunamis, traffic volumes, fires and wind borne debris; as well blast loads and aggressive agents in environment.

The key risks and hazards appears to include additions to traditional design, construction & operation errors and excessive loads. One simple example is hiding of safety-critical information into the big information flow. As in the future the design is likely to be done in a collaborative meetings of dozens of stakeholders in virtual reality, is a word of structural expert any longer heard, and are all the rapidly occurring design changes properly addressed and reacted. Who will supervise locally the gigantic global companies providing engineering, construction, financing and operation from the same entity, and implementing the project using their own internal technical guidelines?

In countries like Japan, which are known to have severe natural hazards like earthquake, typhoons, landslides and tsunamis, risk-handling procedures and nation disaster recovery plans are obviously well established. In countries like Finland, where such natural disaster do not exist at the moment, the viewpoint is slightly different. As an example, new energy saving requirements in house heating during winter put the insulation needs and interests to locally produced and stored energy onto new level. Little is known so far from the mould problems, toxicity and other health hazards the related structures might cause; or increased fire loads the new equipment may produce. These are just few examples of thinking that reasons the structural robustness to be more topical than before. Our thinking of all possible risks and hazards is limited by its nature, but we can start design our structures to be more robust – no matter what is the reason of the malfunction or failure. It could be a human error in a busy project team, as well as a new microbe that starts spreading in warmed climate and eat away the foundations of our structures.

Structural safety and robustness were addressed in two IABSE workshops and a summit in years 2013, 2014 and 2015 in Finland. Being impressed with the productive discussions and the scientific work already conducted in various countries, we would will like to continue this dialogue. IABSE Summit *Global Risks in Structural Engineering* serves a meeting point to professional who would like to extend discussion of the theme beyond the ordinary viewpoints. The Summit copes to locate itself between scientific conferences and annual meetings of engineering societies. Speakers are not requested to provide scientific papers, but yet the discussions are targeted to base on the solid background of science. The target is to identify those issues, methods and concepts that the most topical, and should be addressed more thoroughly in upcoming larger events. We heartily welcome you to the IABSE Summit to hear your contribution!

Dr. Prof. Risto Kiviluoma
Aalto University
Finland

Dr. Prof. Joan Casas
Technical University of Catalonia
Barcelona, Spain

Dr. Prof. (Emer.) Ayaho Miyamoto
Yamaguchi University, Japan
Visiting Professor, Aalto University

Purpose of the summit

The summit theme *global risks in structural engineering* refers to the recent and future risks in civil and structural engineering sectors. The purpose of the summit is to provide a meeting point and discussion forum to any professional interest to the theme in a wide sense. These include engineers, architects, developers, researchers, teachers and association representatives. Summit is targeted to everybody from young professionals to eminent: each opinion and viewpoint is valuable to address the theme.

Keynote speakers are invited as multidisciplinary bases and aim to present the best skills and experience on their field. This gives the participants a possibility to learn new ideas and best practices.

The summit includes general panel discussions where the stage-of-the art and future trends can be reviewed. If urged, the summit can gather statements or recommendations towards IABSE and national structural engineering associations. These may include recommendation for arranging future events or other modes of collaboration on specific topics.

The summit is an international engineering event that by its size is between associations' annual meetings and engineering conferences. It aims to be more versatile and flexible to address emerging professional issues than scientific conferences; both for the invited speakers and for the participants. The summit is part of organisers' plan to better serve the needs of the structural engineers by arranging international engineering science workshop or conference every other year and smaller, more adaptable, international event meanwhile.

Programme

Program consists two days of invited key-note lectures and panel discussions.

Summit venue is split to two cities, Helsinki and Barcelona. It starts in Helsinki with get together at Wednesday evening. The events in Helsinki are arranged at the cosy office premises of RIL in the city. At the end of the first Summit day on Thursday, the participants are transported to Helsinki Airport for the flight to Barcelona. The 2nd Summit day is arranged in Technical University of Catalonia, Barcelona. Summit dinner is held in Barcelona at the evening of the 2nd day.

Finnish Group IABSE

Wednesday March 9th

RIL, Lapinlahdenkatu 1 B, Helsinki, Finland	
16:00	Annual meeting of the Finnish group of IABSE (to Finnish members only)
18:00-20:00	*Summit get together*

Thursday March 10th

RIL, Lapinlahdenkatu 1 B, Helsinki, Finland	
8:30	*Summit registration open, coffee buffet*
9:00	Opening of the summit
9:10	Reliability-based assessment of structures for extreme events, **Mitsuyoshi Akiyama**
9:40	Performance assessment of concrete structures in chloride-rich environments, **Hiroshi Yokota**
10:10	*Break*
10:30	Is the data obtained through non-destructive testing reliable? **Rosemarie Helmerich**
11:00	Impact resistance of structures subjected to tornado missiles, **Masuhiro Beppu**
11:30	*Lunch*
12:30	Does certification reduce risks in design and construction? **Marita Mäkinen**
13:00	Risk handling practices in construction, **Hannu Hänninen**
13:30	*Break*
13:50	Panel discussion
14:50	Close of the day 1
15:00	*Transportation to the airport for the flight to Barcelona*
Flight to Barcelona (by Finnair AY3269) 17:25-20:20	

Friday March 11th

Technical University of Catalonia, Barcelona	
10:00	Opening and welcome
10:15	New risk-based Wind Design Specification for highway bridges in China, **Airong Chen**
10:45	Disaster hazards in South America: state-of-the-art and a proposal for infrastructure, **Matias Valenzuela**
11:15	*Break*
11:45	Probabilistic seismic risk evaluation of urban areas, **Alex H. Barbat**
12:15	Damage modes of concrete structures in major earthquakes, **Ayaho Miyamoto**
12:45	*Lunch*
14:00	Robustness of structures – a review, **Risto Kiviluoma**
14:30	Closing discussions, end of the Summit
15:00-16:00	Tour to the Technical University of Catalonia
20:00-	*Summit dinner, Barcelona*

Saturday March 12th

Unofficial managed site-seeing in Barcelona for those staying over the weekend

Keynotes, 1st day, Helsinki

Reliability-based assessment of structures for extreme events

Prof., Dr. **Mitsuyoshi Akiyama**, Japan

Waseda University

Mitsuyoshi has got his academic degrees from Tohoku University 1995, 1997 and 2001. His research interest and expertise include concrete engineering; earthquake engineering; safety and reliability in structural engineering; life-cycle engineering; seismic design methodology of concrete structures; and deterioration modelling of materials. He is recipient of the JSCE Yoshida Award 1999, 2007 and 2010.

Performance assessment of concrete structures in chloride-rich environments

Prof., Dr. **Hiroshi Yokota**, Japan

Hokkaido University

Hiroshi graduated 1980 from Tokyo Institute of Technology and got his doctoral degree from the same institute 1993.His research interest include structural concrete; performance-based design; life-cycle civil engineering; life cycle management and conservation of civil infrastructure. He has been working in Port and Harbour Research Institute Ministry of Transport; and Port and Airport Research Institute; before starting as professor at Faculty of Engineering, Hokkaido University 2009. He is recipient of the Holcim Award 2007; and JSCE Prize on New Technology Development 2005.

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Is the data obtained through non-destructive testing reliable?

Dr **Rosemarie Helmerich**, German

BAM, Federal Institute for Materials Research, Berlin

Rosemarie has been working for 25 years in design and research of industrial infrastructure, testing of existing bridges in the field and in full-scale laboratory testing. During the last decade she has been active in research in the field of non-destructive testing. Rosemarie graduated from Slovak Technical University in Bratislava and got her doctoral degree from Wroclaw University of Technology, Poland. Her dissertation titled ‘Riveted steel bridges-semantic management of knowledge’ discusses the feasibility of how to preserve the knowledge of experienced engineers in the field of riveted bridges with possibility to preserve and reuse it in a modern way.

Impact resistance of structures subjected to tornado missiles

Dr. **Masuhiro Beppu**, Japan

National Defence Academy of Japan, Yokosuka

Masuhiro's research is focusing to the impact response of structures, including applications to blast-resistant design and impact-resistant design, failure modelling and damage mechanics. He has got his doctoral degree from the Yamaguchi University 2000.

Does certification reduce risks in design and construction?

Ms. **Marita Mäkelä**, Finland

Qualification of Professionals in Building, HVAC and Real Estate Sector in Finland FISE Oy, Helsinki

Marita got her M.Sc. 1995 from Tampere University of Technology, Finland. She has worked as a structural engineer for 10 years doing mainly design of reinforced and prestressed concrete structures. After that she was assigned as a lecturer and head of degree program in HÄME University of Applied Sciences, Finland. Since 2014 she has been working as a managing director in FISE Oy.

Risk handling practices in construction

Dr. **Hannu Hänninen**, Finland

Safety Investigation Authority Finland

Hänninen has studied organizational and technological accidents, risk handling practices, risk regulation and accident investigation. His discipline is Organizational Studies. He worked as a researcher at the Aalto University School of Business from 1996 until 2012. The last three years Hänninen worked as an independent researcher and accident investigator. Hänninen is newly appointed as accident investigator for the Safety Investigation Authority Finland..

Keynotes, 2nd day, Barcelona

New risk-based Wind Design Specification for highway bridges in China

Prof., Dr. **Airong Chen**, China

Tongji University, Shanghai

Airong graduated from Tongji University 1983 and got his M.Sc. from Xi'an Highway Transportation University 1986. He got his doctoral degree from Tongji University 1993. His research interests include life-cycle-design theory of bridges, bridge risk assessment, bridge aesthetic design, bridge performance under extreme events, traffic safety of bridges under severe climates, bridge aerodynamics and conceptual design of bridges. Airong is recipient of the first National Science and Technology Progress Award of China 2009.

Disaster hazards in South America: state-of-the-art and a proposal for infrastructure

Dr. **Matias Valenzuela**, Chile

Ministry of Public Works in Chile

Matias has got P.E. Civil Engineering from the University of Chile. He graduated M.Sc. of Structural and Construction Engineering and got Ph.D. in Construction Engineering from Technical University of Catalonia, Barcelona, Spain. Matias is Fiscal Inspector at Ministry of Public Works in Chile and Head of Design and Engineering of the Chacao Multi-Span Suspension bridge. He works actively in international engineering associations including PIARC, IABSE and IABMAS. His research areas include cable supported bridges, heuristic optim*i*zation methods, management of structures, and maintenance of large structures.

Probabilistic seismic risk evaluation of urban areas

Prof., Dr. **Alex H. Barbat**, Spain

Technical University of Catalonia (UPC), Barcelona

Alex is a civil engineer and professor of Structural Mechanics and Earthquake Engineering at UPC. His current research fields include evaluation of damage in reinforced concrete and masonry buildings; evaluation of seismic vulnerability and risk of structures; and seismic risk evaluation at country, regional and local level. He is the President of the Spanish Association of Earthquake Engineering, and editor or associate editor of various international journals. He received three Honorary Doctorates in Romania: Doctor Honoris Causa by the by the “Ovidius” University 2011; by the Technical University “Gh. Asachi” of Iasi 2011; and by the Technical University of Cluj-Napoca 2013.

Registration

The on-line registration is open at the summit website **http://www.ril.fi/iabse2016**

On-line registration will close 5 March, 2016. Registration fees are:

- IABSE or RIL members: **470 Eur** (Incl. VAT 24 %)
- others, regular registration fee: **520 Eur** (Incl. VAT 24 %)
- participation to the program in Helsinki only **250** Eur / **270** Eur.

The registration fee includes:

- Summit get together
- Technical program. Lunch and the coffee buffet in Helsinki (the 1st Summit day)
- transportation to the Helsinki Airport
- lunch and technical program in Barcelona (the 2nd Summit day)
- Summit dinner in Barcelona

Participants are assumed to reserve hotels and flight tickets (including Helsinki-Barcelona) themselves. We recommend that participants book the FINNAIR flight AY3269 to Barcelona (departs 17.25 from Helsinki and arrives 20.20 to Barcelona).

Flights can be booked for example using www.skyscanner.com website (in most cases cheaper than the airline's own website)

For your stay in Helsinki here are few hotels which are all within walking distance from the venue.

Radisson BLU Royal hotel Helsinki:
https://www.radissonblu.com/en/royalhotel-helsinki

Original Sokos Hotel Albert
https://www.sokoshotels.fi/en/helsinki/sokos-hotel-albert

Solo Sokos Hotel Aleksanteri
https://www.sokoshotels.fi/en/helsinki/sokos-hotel-aleksanteri

Scandic Simonkenttä
http://www.scandichotels.com/Hotels/Finland/Helsinki/Scandic-Simonkentta/#.VffJihHtlBc

For any questions please contact the workshop secretariat: **ville.raasakka@ril.fi** or +358 50 366 8687.

Venues

Start of the Summit takes place in facilities of RIL, Lapinlahdenkatu 1 B, Helsinki. The venue is from walking distance from the main railway/bus station of Helsinki.

The 2nd day of the summit is run in Technical University of Catalonia, Barcelona (Calle Jordi Girona, 31). It is best accessed by metro (Green Line L3) or by taxi.

General information

Language
The official language of the summit is English. Oral presentation and discussion will be in English only.

Weather in Helsinki region
Mid April is usually the start of spring season in the Southern Finland. Daylight time is already long, with sun rise 6:30 and set 20:30. The average day temperature is estimated to be around 3°C.

Visa and passport
Finland and Spain are both countries of European Union and belong to Shengen area. Nationals of the Shengen countries do not need a visa to enter Finland or Spain.

About IABSE

The International Association for Bridge and Structural Engineering (IABSE) was founded in 1929. Today, IABSE has 4000 members in over 100 countries. The mission of IABSE is to promote the exchange of knowledge and to advance the practice of structural engineering worldwide in the service of the profession and society. To accomplish its mission, IABSE organizes conferences and publishes the quarterly journal Structural Engineering International (SEI), as well as reports and other monographs. IABSE also presents annual awards for outstanding achievements in research and practice that advance the profession of structural engineering.

More information about IABSE:

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Further information

Summit website **http://www.ril.fi/iabse2016**

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