



[www.sfpe.org](http://www.sfpe.org)

# 8<sup>th</sup> International Conference on Performance-Based Codes and Fire Safety Design Methods

Lund University • Sweden, 16–18 June 2010



**Co-sponsors:**

Society of Fire Protection Engineers  
SFPE Sweden Chapter

International Council for Research  
and Innovation in Building and  
Construction (CIB)

Lund University



# 8<sup>th</sup> International Conference on Performance-Based Codes and Fire Safety Design Methods

Lund University • Sweden, 16–18 June 2010

Performance-based fire protection design continues to grow in use and acceptance. However, fire protection engineering has not reached the state of other engineering disciplines, where performance-based design is the norm. Because it is an advancing field, major new developments occur at a rapid pace.

Starting in 1996, the Society of Fire Protection Engineers, along with several partner organizations, has held a biennial conference to showcase the state-of-the-art in performance-based code approaches and engineering design methods. In 2010, this conference will return to Sweden, a country that boasts more fire engineers per capita than any other nation in the world.

The International Conference on Performance-Based Codes and Fire Safety Design Methods has established a reputation within the fire protection engineering community as the paramount event for keeping abreast of advancements in performance-based fire protection design. This year's conference provides attendees a unique opportunity to learn from the world's leading experts.

## **PROGRAM COMMITTEE:**

**David Charters**, Building Research Establishment LTD, United Kingdom

**George Hadjisophocleous**, Carleton University, Canada

**Morgan Hurley**, Society of Fire Protection Engineers, USA

**Peter Johnson**, ARUP Fire, Australia

**Robert Jönsson**, Lund University, Sweden

**Jöel Kruppa**, CTICM, France

**Brian Meacham**, Worcester Polytechnic Institute, USA

**James Milke**, University of Maryland, USA

**Ai Sekizawa**, University of Tokyo, Japan

**Michael Strömgren**, The National Board of Housing, Building and Planning, Sweden

**Beth Tubbs**, International Code Council, USA

## **ORGANIZING COMMITTEE:**

**Julie Gordon**, Society of Fire Protection Engineers, USA

**Robert Jönsson**, Lund University, Sweden

# CONFERENCE PROGRAM

WEDNESDAY, 16 JUNE 2010 | Performance-Based Codes

0900 – 0915 **Welcome**

0915 – 0940 **The Need for Adequate Risk Estimates to Evaluate Equivalent Safety**

J. Lundin

0940 – 1005 **Impact of Objective-Based Codes in Canada**

G. Gosselin and D. Bergeron

1005 – 1030 **Performance-Based Building Regulations — The Next Generation of the Swedish Fire Safety Code**

C. Cronsjoe, M. Strömngren, S. Abrahamsson, and T. Rantatalo

1030 – 1100 **Break**

1100 – 1215 **Parallel Sessions**

**A New Framework for Performance Based Fire Engineering Design in New Zealand**

N. Saunders, P. Beever, C. Wade, C. Fleischman, P. Thorby, and I. Miller

**The Probabilistic Approach — A New Challenge to Performance-Based Regulatory Systems**

I.J. van Straalen

**Experiences on Introducing Functional Fire Safety Requirements in the Building Regulations of Norway**

W. William Heskestad, B. Stenstad, and W. Bjørkman

**Analysis of Fire Statistics for Establishing Benchmark Fire Risk for Evacuation Safety Designs of Buildings**

Y. Ikehata, H. Notake, J. Yamaguchi, and T. Tanaka

**Past, Present and Future of Performance Based Approaches in China**

F. Li and F. Liu

**Risk-Based Selection of Design Fire Scenarios in Performance Based Evacuation Safety Designs of Buildings**

D. Nii, J. Yamaguchi, R. Mase, H. Notake, Y. Ikehata, and T. Tanaka

1215 – 1400 **Lunch**

1400 – 1515 **Parallel Sessions**

**Performance-based Fire Safety Regulatory System in Taiwan — From the Fire Authority Perspective**

N. Tseng and T. Shen

**Verifying Trade-Offs When Using Sprinklers in Fire Safety Design**

F. Nystedt

**Performance-Based Codes — A South African Experience**

T. Williams

**The Study of Operation Management of Performance-Based Designed Buildings in Taiwan — Three Case Studies of A Shopping Center, An Exhibition Hall and A Coliseum**

E. Kuo and W. Li

**Development of Performance-Based Fire Regulations in Poland — An Advanced Draft Under Consultation**

D. Ratajczak and P. Tofilo

**Finding the Performance in Performance Based Codes**

E. Almgren

1515 – 1545 **Break**

1545 – 1700 **Parallel sessions**

**Has Fire Engineering Lived up to Expectations?**

P. Wilkinson

**The Performance-based Approach to Provide Alternative Solutions in the Construction of Buildings in Bush (Wildfire) Prone Areas**

R. Manser

**Use of ICC Design Performance Levels to Determine Fire Safety Provisions — Designing for Community Importance**

D. Barber and P. Johnson

**Delivery of Passive Fire Protection in a Performance-Based Regulatory Environment**

G. Baker, N. Saunders, and K. Kennedy

**A Study of the Impact of Performance-Based Codes and Fire Engineering Methods on the Level of Fire Safety and Costs of Fire Precautions**

D. Charters

**The Derivation of Acceptance Criteria for Risk to Life Based on Optimal Resource Allocation**

K. Kraemer, J. Kohler, and M. Faber



# CONFERENCE PROGRAM

THURSDAY, 17 JUNE 2010 | Fire Safety Design Methods

**0900 – 0925 Representing Egress Behavior in Engineering Terms**

S. Gwynne, E. Kuligowski, and D. Nilsson

**0925 – 0950 Characterizing Fire Scenarios Based on New Zealand Fire Incident Data**

A. P. Robbins and C. Wade

**0950 – 1015 Break**

**1015 – 1200 Parallel Sessions**

**Numerical Modeling of Flashover in Experimental Compartment Fires**

S. Li, Z. Yan, I. Chen, and G. Liao

**Method for Calculating Heat Fluxes from a Warehouse Fire**

C. Thauvoye, P. Russo, J.M. Blanchet, S. Duplantier, J. Kruppa, A. Muller, S. Patej, J. Taveau, and B. Zhao

**Protection of Warehouses and Large Storage Occupancies using a Scientific Approach towards Commodity Classification**

M.J. Gollner, K. Overholt, A.S. Rangwala, F.A. Williams, and J. Perricone

**An Approach to Fire Safety Design for Furniture and Fittings**

B. Sundström, M. Olander, S. Bengtson, I. Larsson, M. Arvidson, and A. Apell

**Fire Safety Design for Textile Membranes in Buildings**

P. Andersson, P. Blomqvist, M. Hjohlmán, and H. Tuovinen

**Increased Quality and Reduced Uncertainty when Using Fire Dynamics Simulator**

D. Tonegran and M. Ryber

**Method of Calculating the Starting Time of Fire Evacuation**

S. Yoshino, J. Yamaguchi, and K. Muraoka

**A Comparison of Evacuation Prediction made using Agent-based Simulation and Code-based Approaches**

N.P. Waterson, C.J.E. Castle, and S. Le Bail

**1200 – 1400 Lunch**

**1400 – 1515 Parallel Sessions**

**Comparison of A Multi-Layer Zone Smoke Spread Model, A Two-Layer Zone and FDS to a Building Fire**

K. Suzuki and T. Tanaka

**Fire and Collapse — Faculty of Architecture Building, Delft University of Technology: Implications for Performance-Based Design**

B. Meacham, H. Park, M. Engelhardt, V. Kodur, I.J. van Straalen, J. Maljaars, K. van Weeren, R. de Feijter, and K. Both

**FDS+Evac: V & V of the Staircase Model**

T. Korhonen and S. Hostikka

**A Performance Based Methodology for Specifying Design Fires for Structural Analysis**

J. Stern-Gottfried, G. Rein, and J. Torero

**Toxic-Hazard Prediction: Possibilities and Limitations of Toxicity Modeling by FDS 5 vs. FDS 4**

K. Grewolls and T.R. Hull

**Structural Fire Loads in a Modern Tall Building Design**

L. Rzdolsky

**1515 – 1545 Break**

**1545 – 1700 Parallel Sessions**

**Numerical Study of Elevator and Stairwell Shaft Pressurization Systems Using Detailed Building Models**

D. Bowers, J. Ellison, D.E. Beasley, and R.S. Miller

**Probabilistic Assessment and Economic Evaluation of Performance-Based Fire Safety Codes and Building Designs**

G. Ramachandran

**A New Method for Determining the Smoke Layer Height in CFD Simulation**

K. Sommerlund-Thorsen, B.P. Husted, and S. Kilian

**Agent Based Risk Assessment of Fire Safety Systems with Automated Event Tree Analysis**

F.W. Akashah, J. Zhang, M.A. Delichatsios, and H. Wang

**What do you Have to See to Escape a Fire?**

X. Liu

**Fire Risk Assessment of Performance-Based Design of Personal Fire Safety**

J. Norén, and A. Sandberg

**1700 – 1715 Conference Summary**

**1900 Conference Gala Dinner at Kårhuset.**

One conference gala dinner ticket will be included with each registration. Additional tickets are available at \$100 U.S. dollars per person (see the registration page for additional information.)

# CONFERENCE PROGRAM

FRIDAY, 18 JUNE 2010 | **Case Studies**

- 0845 – 0855 Introduction**
- 0855 – 0910 Presentation of Design Actually Implemented**  
E. Almgren
- 0910 – 0955 Swedish Case Study**  
Johan Lundin, WSP Fire & Risk, et al.
- 0955 – 1040 Japanese Case Study**  
Isao Kasahara, SFPE Japan Chapter, et al.
- 1040 – 1110 Break**
- 1110 – 1205 American Case Study**  
William Koffel, Koffel Associates, et al.
- 1205 – 1250 Hong Kong Case Study**  
W. K. Chow, Hong Kong Polytechnic University, et al.
- 1250 – 1400 Lunch**
- 1400 – 1445 Australian Case Study**  
Ian Thomas, Victoria University, et al.
- 1445 – 1515 Break**
- 1515 – 1600 French Case Study**  
François Demouge, Centre Scientifique et Technique du Bâtiment, et al.
- 1600 – 1645 New Zealand Case Study**  
Charles Fleischmann, University of Canterbury, et al.
- 1645 – 1710 A Perspective Review of the International Case Studies**  
C. Hofmeister and J. Lundin



Turning Torso,  
Malmö, Sweden

# LOCATION, TRAVEL AND ACCOMMODATION

The 8th International Conference on Performance-Based Codes and Fire Safety Design Methods will be held at Lund University in Lund, Sweden. The venue for the conference is Kårhuset, John Ericssons väg 3 in Lund, which is only a 15 minute walk from the city centre. It is also possible to reach Kårhuset by bus (number 6 to Ö Linero, number 20 or 21 to Brunnshög). For a map of the campus, visit [www.lth.se/english/contact/maps/](http://www.lth.se/english/contact/maps/).

## AIRPORTS

The two airports that are closest to Lund are Copenhagen Airport (CPH) in Denmark and Malmö Airport (MMX) in Sweden. It is possible to come to Copenhagen Airport from many international airports. Malmö Airport is a small airport with connections to other Swedish and some European airports.

## FROM THE AIRPORT TO LUND

The easiest way to get from Copenhagen Airport (CPH) to Lund is by train. Trains run regularly between Copenhagen Airport and Malmö Central Station (Malmö C), and the trip takes about 20 minutes. Some trains also continue directly from Malmö C to Lund Central Station (Lund C). Trains run regularly between Malmö C and Lund C, and a trip takes about 15 minutes. For train timetables in the Öresund region (eastern Denmark and southern Sweden) please visit [www.skanetrafiken.se/](http://www.skanetrafiken.se/).

## TRAINS FROM THE EUROPEAN CONTINENT

It is possible to travel by train from the European continent to Malmö Central Station (Malmö C). Trains run regularly between Malmö C and Lund Central Station (Lund C), and a trip takes about 15 minutes. For train timetables between Malmö and Lund please visit [www.skanetrafiken.se/](http://www.skanetrafiken.se/).

## HOTEL ACCOMMODATIONS

Room blocks have been made at nine local hotels for your convenience. Please note that 1 U.S.\$ ≈ 7,20 SEK. When making your reservations, you **MUST** state the code "SFPE Conference 2010" and the hotel booking number.

**Hotel Concordia** offers a stay in a modern convenient, totally renovated, hundred-year old cultural house in the center of the town. The price for a single room is 1115 SEK. Reservations must be made no later than May 16, and their booking number is 291 06. Address: Stålbrogatan 1, 222 24 Lund. Phone: +46 46 13 50 50. E-mail: [info@concordia.se](mailto:info@concordia.se). Website: [www.concordia.se](http://www.concordia.se)

**Scandic Star Hotel** is located on the outskirts of Lund, near the motorway between Lund and Malmö and 2,5 km from the town center. The price for a single room is 1285 SEK. Reservations must be made no later than April 19. The booking number is LTH150610. The hotel's English homepage offers an on-line booking service; if you use it, the booking number is BLTH150610. Address: Glimmervägen 5, 220 11 Lund. Phone: +46 46 285 25 00. E-mail: [starlund@scandichotels.com](mailto:starlund@scandichotels.com). Website: [www.scandichotels.com](http://www.scandichotels.com).

**Hotel Duxiana** is located in the heart of Lund, a stone's throw from the municipal library, the University and the Central Station. The hotel is situated in a stylish hundred year old, four-story house. The price for a single room is 1100 SEK. Reservations must be made no later than April 15. The hotel's booking number is 009703. Address: St Petri Kyrkogata 7, 222 21 Lund. Phone: +46 46 13 55 19. E-mail: [info@lund.hotelduxiana.com](mailto:info@lund.hotelduxiana.com). Website: [www.lund.hotelduxiana.com](http://www.lund.hotelduxiana.com).

**Hotel Sparta** is located at Tunavägen 39, 223 63 Lund, a five minute walk to Kårhuset. The price is 657 SEK for a single and 890 SEK for a double room. Reservations must be made no later than May 15. Phone: + 46 46 19 16 00. E-mail: [hotel.sparta@samhall.se](mailto:hotel.sparta@samhall.se). Website: [www.spartahotell.se](http://www.spartahotell.se).

**First Hotel Planetstaden** is located at Dalbyvägen 38, 224 60 Lund. The price is 982 SEK for a single and 1189 SEK for a double room. Reservations must be made no later than April 19. The hotel's booking number is 47950. Phone: +46 46 280 01 00. E-mail: [planetstaden.lund@firsthotels.se](mailto:planetstaden.lund@firsthotels.se). Website: [www.firsthotels.com](http://www.firsthotels.com).

**IBIS Hotel** is located on the outskirts of Lund, 3 km from the town center. The price for a single/double room is 1056 SEK. Reservations must be made no later than May 25. The hotel's booking number is 160716. Address: Förhandlingsvägen 4, 227 61 Lund. Phone: +46 46 31 36 30. E-mail: [h2867@accor.com](mailto:h2867@accor.com). Website: [www.accorhotels.com](http://www.accorhotels.com).

**Hotel Djingis Kahn** is located approximately 1 km from the town center. The price for a single is 1144 SEK, a double is 1308 SEK and a business is 1435 SEK. Reservations must be made no later than May 14. The hotel's booking number is 55041. Address: Margaretavägen 7, 222 40 Lund. Phone: +46 46 33 36 00. E-mail: [info@djingiskhan.se](mailto:info@djingiskhan.se). Website: [www.djingiskhan.se](http://www.djingiskhan.se).

**Grand Hotel** is located in the town center. The price for a single is 1495 SEK and a double room is 1885 SEK. Reservations must be made no later than April 15. The hotel's booking number is LTH150610. Address: Bantorget 1, 222 29 Lund. Phone: +46 46 280 61 00. E-mail: [hotel@grandilund.se](mailto:hotel@grandilund.se). Website: [www.grandilund.se](http://www.grandilund.se).

**Hotel Lundia** is located in the town center. The price for a single is 1435 SEK and the price for a double room is 1795 SEK. Reservations must be made no later than April 15. The hotel's booking number is LTH150610. Address: Knut den Stores gata 2, 221 04 Lund. Phone: +46 46 280 65 00. E-mail: [info@lundia.se](mailto:info@lundia.se). Website: [www.lundia.se](http://www.lundia.se).

*Note: The prices for the rooms are subject to change.*



# REGISTRATION

## There are three easy ways to register:

- 1. Register Online:** Register online on SFPE's secure website: [www.sfpe.org](http://www.sfpe.org). Follow the easy online directions.
- 2. Register by Fax/Email:** Complete the registration form in this brochure and fax it to SFPE at +1.301.718.2242 or email to [conference@sfpe.org](mailto:conference@sfpe.org).
- 3. Register by Mail:** Complete the registration form in this brochure and mail to:  
**8th International Conference on Performance-Based Codes and Fire Safety Design Methods,**  
**c/o Society of Fire Protection Engineers, 7315 Wisconsin Avenue, Suite 620E, Bethesda, MD 20814, USA.**

## CONFERENCE REGISTRATION FORM

Please complete this form and return it to:

### 8th International Conference on Performance-Based Codes and Fire Safety Design Methods

7315 Wisconsin Avenue, Suite 620E, Bethesda, MD 20814, USA, phone: +1.301.718.2910, fax: +1.301.718.2242  
email: [conference@sfpe.org](mailto:conference@sfpe.org), [www.sfpe.org](http://www.sfpe.org)

Name \_\_\_\_\_  
First Initial Last

Organization \_\_\_\_\_

Address \_\_\_\_\_

City/Town \_\_\_\_\_

Prov/State \_\_\_\_\_

Postal Code \_\_\_\_\_

Country \_\_\_\_\_

Phone \_\_\_\_\_

Email \_\_\_\_\_

Nickname: i.e. "Rich" \_\_\_\_\_

Special Requirement \_\_\_\_\_

Dietary or accessibility

### Method of Payment

Check Enclosed (made payable to SFPE in U.S. dollars)

Credit Card

American Express  Visa  MasterCard

Name on Card \_\_\_\_\_

Card Number \_\_\_\_\_

Exp. Date \_\_\_\_\_

CSV Code \_\_\_\_\_

Signature \_\_\_\_\_

### Member Information

This section must be completed to receive member discount.

SFPE Member \* My member number is \_\_\_\_\_

CIB  Non-Member

### Registration Fees

#### Advance Registration Fees (Must be received by 30 April 2010)

\$800 U.S. Dollars SFPE/CIB Members \$ \_\_\_\_\_

\$950 U.S. Dollars Non-Members \$ \_\_\_\_\_

#### Registration Fees (Received after 30 April 2010)

\$900 U.S. Dollars SFPE/CIB Members \$ \_\_\_\_\_

\$1,075 U.S. Dollars Non-Members \$ \_\_\_\_\_

#### Gala Dinner Ticket

1 Ticket included with Registration fee **\$FREE**

Additional Tickets:

Qty \_\_\_\_\_ x \$100 U.S. Dollars \$ \_\_\_\_\_

**TOTAL: \$ \_\_\_\_\_**

**Payment MUST accompany the registration form.** A receipt will be sent as confirmation via email. We accept American Express, Visa, or MasterCard payments. All cheques must be made payable in U.S. dollars to "SFPE."

**Advance Registration** is available through Friday, 30 April 2010. **Registration** is available from 30 April 2010 until Monday, 24 May 2010. After 24 May 2010, registration will be available on-site only. **On-site registration** will be offered on-site Wednesday, 16 June 2010 from 0800 to 1700 at Lund University, Kårhuset.

### Special Requirements

If you have any special requirements due to disability or special dietary needs, such as: vegetarian, pork, shell fish, etc., please contact SFPE Headquarters at +1.301.718.2910 ext. 104, email at [conference@sfpe.org](mailto:conference@sfpe.org), or indicate your requirements on this Conference Registration Form.

SFPE EDUCATION & SCIENTIFIC FOUNDATION  
7315 Wisconsin Ave., Suite 620E | Bethesda, MD 20814

PRST STD  
U.S. POSTAGE  
**PAID**  
SUBURBAN MD  
PERMIT NO. 2295




# 8<sup>th</sup> International Conference on Performance-Based Codes and Fire Safety Design Methods

Lund University • Sweden, 16–18 June 2010

www.sfpe.org



Co-sponsors:  
Society of Fire  
Protection Engineers  
SFPE Sweden Chapter  
International Council  
for Research and  
Innovation in Building  
and Construction (ICIB)  
Lund University



8<sup>th</sup> International Conference  
on Performance-Based Codes  
and Fire Safety Design Methods  
Lund University • Sweden, 16–18 June 2010