Performance-Based Design for Fire Safety – Smoke Control Design

Introduction
Traditional fire safety design in a prescriptive regulatory environment is usually achieved by designing various components in isolation. The building layout must usually meet certain requirements, such as compartment size, escape distances and exit dimensions. In some occasions, the prescriptive smoke control design methods result in unnecessary cost or may not be effective in achieving the objective.

Recent development of fire safety engineering and regulations towards performance-based design in many countries including Singapore allows possibilities for optimising building design without compromising safety. With better understanding of fire and smoke dynamics and the use of computational modelling, smoke control system can be designed more effectively and more specific to the need of the building concerned.

This workshop, jointly organised by BCA Academy and Protective Technology Research Centre (PTRC) of the Nanyang Technological University (NTU), will bring the participants through the general design approaches with empirical design calculation methods. To illustrate the application of performance-based approach, ventilation strategies for different types of building will be discussed.

Objectives
This workshop aims to enable the participants to review the mechanism of smoke control with different ventilation methods including natural ventilation and mechanical ventilation by means of extraction or pressurisation, to achieve the design objective, and apply the performance-based approach in smoke control design. The design methods will be based on various standards such as the British Standards and NFPA.

Workshop Outline
The following topics will be covered in the workshop:

- **SMOKE CONTROL DESIGN**
  - Design features of smoke control system
  - Smoke plume calculation
  - Method of analysis - steady state and transient analysis
  - Evacuation strategy
  - Computational modelling – smoke and evacuation modelling
  - Pressurisation

- **SMOKE CONTROL STRATEGIES**
  - Objectives, performance criteria, design methods with case studies for shopping mall, residential building, car park and tunnel.

Workshop Leader
Dr Timothy Liu obtained his PhD study from the University of Manchester, and subsequently lectured in the same university. He also conducted academic research in structural design and structural fire engineering and has written a few publications on these topics. The primary interest of his research was the development of a finite element package for the assessment of performance of structures in fire. Being an independent fire consultant, Dr Liu provides fire safety strategy and conducts fire engineering design for many projects which are of high profile in terms of project value and/or innovation. With his vast experience and familiarity with British Standard, European and NFPA design codes, he has been invited to work in many projects in UK and worldwide, such as the high-speed rail tunnels in Taiwan, casino in Macau, and indoor ski slope of UAE. Many of these involved specific smoke control system for the various purposes from occupant protection to property protection. Dr Liu is the principal author of some fire engineering computer software such as TRAD (building radiation) and CAFÉ (general fire engineering application). These software have been used widely by many fire consultants and regulatory bodies in the UK, Canada and Singapore on projects around the world.
REGISTRATION FORM

2-day workshop on Performance-Based Design for Fire Safety – Smoke Control Design

Date: ____________________
Time: 9.00am to 6.00pm
Venue: BCA Academy
Fee (incl of GST): S$800.00

PARTICIPANT PARTICULARS

Name: (Dr/Mr/Mrs/Ms): ____________________________
(NIC/Passport/FIN No.): ____________________________
Designation: ____________________________
Company Name: ____________________________
Mailing Address: ____________________________
Postal Code: ____________________________
Tel No.: ____________________________
Fax No.: ____________________________
Email Address: ____________________________

CONTACT PERSON PARTICULARS (if different from the above)

Name: (Dr/Mr/Mrs/Ms): ____________________________
Designation: ____________________________
Tel No.: ____________________________
Fax No.: ____________________________
Email Address: ____________________________

PAYMENT

Enclosed is a Cheque No.: ____________________________
(Please note: Cheque should be crossed, marked “account payee only” and payable to Building and Construction Authority)

For Official Use
Application No.: ____________________________
Official Receipt No.: ____________________________
Processing Officer: ____________________________
Cashier: ____________________________

TERMS AND CONDITIONS

By submitting and signing this application form, the company and individual applicant agree to the following:

a. The company and individual applicant has read and understood the terms of the brochure (if available) and the application form.
b. The company and individual applicant warrant that the particulars given in the application form are accurate.
c. The Building and Construction Authority (BCA) can disclose to other government agencies any information relating to this application.
d. Payment for the course must be made before the course commencement date.
e. Any Direct Debit and Direct Credit Authorisation for GIRO applications previously signed and passed to BCA will apply to payments made under this course.
f. BCA Academy reserves the right to accept or reject the application for whatever reason.
g. BCA Academy shall at its discretion allocate a space to the registered applicant, based on availability.
h. BCA Academy reserves the right to amend any details relating to the course, revise the course fees without prior notice, cancel or postpone the course.
i. No deferment is allowed.
j. Request for withdrawal or replacement must be made in writing. Requests are subject to approval by BCA Academy:
  - Written request for replacement must reach BCA Academy before the course commencement date. There will be no additional charges for suitable replacement.
  - Written request for withdrawal that reaches BCA Academy - At least 2 weeks before the course commencement date: 10% administration fee is payable.
  - Less than 2 weeks but more than 3 working days before the course commencement date: 20% administration fee is payable.
  - 3 working days or less before the course commencement date: there will be no refund of course fee.
k. The Continuing Professional Development (CPD) points indicated for any course offered by BCA Academy is subject to change and final approval by the relevant professional accreditation bodies.
l. Funding and subsidies offered by BCA / BCA Academy or third party organisations for the courses are subject to approval. The company must make the application for funding and subsidies. Neither BCA nor BCA Academy is to be held liable and the company agrees to pay BCA the applicable funding amount if funding and subsidies are either granted at a reduced amount, not granted at all or if funding is revoked, for whatever reason.
m. All information, materials, services, intellectual property and other property and rights provided by BCA and BCA Academy during the course are provided on an “as is" basis. BCA and BCA Academy makes no warranties of any kind, either express or implied, as to any matter, and all such warranties, including warranties of merchantability and fitness for a particular purpose, are expressly disclaimed.

INDIVIDUAL APPLICANT

Name: ____________________________
Signature: ____________________________
Date: ____________________________

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