Seminar
On
Back To Basics In Engineering, Safety & Construction

Seminar Programme

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30am – 9:00am</td>
<td>Registration @ Orchard Hotel, Singapore</td>
</tr>
</tbody>
</table>
| 9:00am – 9:45am | **Keynote:** Tips on Design for Structural Safety
By Chew Keat Chuan, Building Construction Authority |
| 9.45am – 10.30am | Design for Safety: The Hanging Gardens of Singapore
By Chan Yew Kwong, Workplace Safety and Health Council |
| 10.30am – 10.50am | Tea/Coffee Break                                                      |
| 10.50am – 11.35am | Safety in Welding & Cutting
By Mr Sze Thiam Siong Setsco Services Pte Ltd |
| 11.35am – 12.20pm | Safety Management Lessons from Major Accident Inquiries
By Dr Goh Yang Miang, National University Singapore |
| 12.20pm – 12.45pm | Q & A Session                                                          |
| 12.45pm – 1.45pm | Lunch                                                                 |
| 1.45pm – 2.30pm | Basics in Designing ERSS
By Er. Lim Peng Hong, PH Consulting Pte Ltd |
| 2.30pm – 3.15pm | Design of Industrial Rope Access Anchorages and Anchorage Lines: Back to Basics
By Hoe Yee Pin |
| 3.15pm – 3.35pm | Tea/Coffee Break                                                      |
| 3.35pm – 4.20pm | Construction work is hazardous. Can it be safe?
By HC Chiang, United Singapore Builders Pte Ltd |
| 4.20pm – 5.05pm | Importance Of Good Procurement Practice
By Eugene Seah, Langdon & Seah Singapore Pte Ltd |
| 5.05pm – 5.30pm | Q & A Session                                                          |
| 5.30pm          | The End                                                                |

Programme Details

Date:
21 May 2014

Time:
9.00am – 5.30pm

Venue:
Orchard Hotel
Singapore
442 Orchard Road
Singapore 238879

CPD Programme:
7 PDUs - Confirmed
7 SDUs - Confirmed
6 STUs - Confirmed

Fee:
IES member: $220
Non-member: $260
CIJC & WSHO: $235

*Fees inclusive of 7% GST, course materials, lunch and light refreshments.

*Certificate of Attendance will be issued to participants with at least 75% attendance.

Mailing address:
70, Bukit Tinggi Road,
Singapore 289758

Contact Person:
Karen Phua
Tel: 6463 9211
6461 1239
Fax: 6463 9468
Title:
Tips on Design for Structural Safety

Abstract
The paper will focus on strategies to ensure that buildings, including foundation, are stable and robust. The key to safe design is to provide redundancies in the structural system. The lessons learnt from the various failure cases and the common mistakes committed by engineers, including the misuse of computer software for analysis and design of structures, will be shared.

CV
Er. Chew Keat Chuan is the Group Director of Building Engineering Group, Building and Construction Authority (BCA). His portfolio in BCA includes formulating and reviewing policies on building safety, and overseeing the safety of buildings, bridges as well as subways under construction in Singapore. Er. Chew graduated with a first class honours degree in Civil Engineering from the National University of Singapore in 1983 and a Master of Science(Civil Engineering) in 1986. He started work as an engineer in the former Public Works Department supervising construction of bridges and later as a structural engineer designing government buildings. He was posted to Building Control Division in 1992 and has remained there since. He is a Professional Engineer and an Accredited Checker.
Title
Design for Safety: The Hanging Gardens of Singapore

Abstract
"Skyrise Greenery", a term coined in Singapore, first came about in its infancy when Singapore started to see walls being planted with climber plants on large infrastructural developments like flyovers, bridges, etc. With architectural innovation picking up during the early 1990s, there came about the introduction of sky terraces (the idea of bringing public and landscaped spaces up into the mid-levels), roof gardens and vertical green walls. Skyrise greenery has been given more emphasis in recent years. The government has been actively promoting skyrise greenery.

With skyrise greenery, landscape workers are faced with new work hazards, in particular, falling from heights while carrying out maintenance and other landscape-related works on rooftop and vertical greenery. These workers may also need to acquire new work practices to be able to work safely. This paper sheds light on these work hazards and how engineers and designers can apply the Design for Safety process to proactively eliminate or mitigate them at the design stage of building projects.

CV
Yew Kwong is presently the Director of Occupational Safety & Health (OSH) Inspectorate in the Ministry of Manpower's Occupational Safety & Health Division. As Director, he plans and oversees the strategies, programmes and activities of the OSH Inspectorate in the key areas of regulatory enforcement and surveillance, and ensure that the implementation of OSH standards and good practices are effective in the control of workplace hazards and protect the safety and health of the workforce.

He has been with the Ministry of Manpower for about 30 years. His 30 years' working experience in workplace safety & health involves inspection & auditing of worksites, shipyards, chemical plants and other manufacturing factories, investigations into fatal/serious accidents, development of OSH standards, guidance materials, management systems and auditing.

He was also involved in the development and conduct of many workplace safety & health (WSH) training courses for supervisors, WSH professionals and managers. He held the position of Director of Industry Capability Building in the WSH Council for about 2 years (Nov 2011 – Oct 2013), during which he was responsible for the national WSH competency framework and capability building efforts in organisations and individuals.

Yew Kwong is very involved in the development and promotion of WSH-related Singapore Standards. In 2003 - 2004, he was the Chairman of the SPRING's Technical Committee for OSH Management which was responsible for the drafting of the first Singapore Standard SS 506 on OSH management system. He is a member of the Singapore's Standards Council since 2007 and he currently chairs the Council's General Engineering & Safety Standard Committee. He is also Chairman of the Singapore Accreditation Council’s Technical Committee for Mechanical Engineering Inspection.
Title
Safety in Welding & Cutting

Abstract
A basic understanding of safety in welding and cutting processes can protect people from injury and illness and property (including equipment) from damage by fire and explosions. Safety is an important consideration in all welding, cutting and related work. No activity is satisfactorily completed if someone is injured.

CV
Sze Thiam Siong is the Director/General Manager of SETSCO, an established testing, calibration, inspection, training, certification and consultancy firm. He is a qualified trainer for the American Welding Society (AWS) Certified Welding Inspector (CWI) Program. He has been awarded the diplomas of the International Institute of Welding (IIW) as a “International Welding Engineer” and “International Welding Inspector”. He is currently the President of the Singapore Welding Society (SWS). He is the 15th President of Asia Pacific Conference for NDT (APCNDT) 2017 and Executive Committee Member of the Asia Pacific Federation for NDT (APFNDT). He is the Chairman of the Technical Committee on Non-Destructive Testing (NDT), Member of Council Committee for Inspection Bodies (CCIB) and Member of Technical Committee (TC) for Structural Steelwork and Proficiency, Singapore Accreditation Council (SAC). He is a member of Technical Committee on Workplace Safety and Health, and Workgroup on SS 510 - Safety in Welding & Cutting. He is a member of Singapore National Aerospace NDT Board (SNANDTB). He is a member of advisory board and a fellow member of Nondestructive Testing Society Singapore (NDTSS). He is a member of the Advisory Committee on Nuclear Science and Radiation Protection, National Environment Agency (NEA). He is the National NDT Coordinator under IAEA/RCA project. He has extensive experience in the field of welding inspection involving pipelines, pressure vessels, structural steelworks and equipment.
Title
Safety Management Lessons from Major Accident Inquiries

Abstract
This presentation is based on the book of the same title by Goh and Soon (2014). Two of the case studies, Nicoll Highway Collapse and Ginza Plaza Explosion, will be discussed. The abstracts for the two case studies are below.

On 20 April 2004 at about 3.30 p.m., the temporary earth-retaining structure for a deep excavation adjacent to Nicoll Highway collapsed, resulting in four deaths, three injured and a partially collapsed highway. Two container site offices and heavy equipment such as cranes were pulled into the cave-in. The Committee of Inquiry (COI) revealed that the collapse was due to two design errors in the temporary earth-retaining structure, specifically the under-design of the strut-waler connection and diaphragm wall. These errors eventually led to the failure of the ninth-level strut-waler connection when the excavation proceeded below this level. The temporary earth-retaining structure was unable to redistribute loads from the local failure, thus resulting in the catastrophic collapse. The COI also found that large spans of excavation were unsupported for extended period. In addition, there was a lack of emergency evacuation routes and rectification works persisted despite warning signs of an impending collapse. Some of the key underlying management system factors include ineffective organisational structure, inadequate selection and monitoring of sub-contractors, insufficient safety and technical knowledge and ineffective communication. It was also identified that there were safety culture issues in terms of violation of procedures, lack of informed culture and challenges of production pressure.

On 7 August 1992, at about 2:10 p.m., an explosion occurred at the Ginza Plaza worksite, which was located in the West Coast area of Singapore. The explosion resulted in four deaths, 61 injuries and a severely damaged building. A Committee of Inquiry (COI) was convened and the investigation showed that the explosion was due to the ignition of town gas that accumulated in the building under construction. Public Utilities Board introduced town gas into the gas pipes belonging to the project without notifying the developer of the shopping mall. Even though personnel on site detected an unidentified gas prior to the explosion, no one realized that the emission was town gas. Thus, when hot work was conducted in the presence of town gas, an explosion occurred. In fact, a considerable volume of town gas had accumulated in the ceiling space and this, most probably, contributed to the scale of the explosion. The major accident showed the importance of having a robust industry standard, effective plan submission and approval systems, systematic site inspections and records management, lock-out tag-out (LOTO) system and hazard reporting system. In addition, the case also illustrated how a culture of violation and silo mentality can defeat risk controls.

CV
Dr Goh is an Assistant Professor with the National University of Singapore. He currently leads the Safety and Resilience Research Unit (SaRRU) in the Centre for Project Management and Construction Law. At the same time, he is the Deputy Programme Director for the Bachelor of Project and Facilities Management in the Department of Building, NUS. He is a specialist in Workplace Safety and Health (WSH) and risk management. He was a senior consultant assisting companies to improve their risk and WSH management capabilities. He is an Approved Workplace Safety and Health Auditor and has expertise in quantitative risk assessment. He was the Assistant Director (Investigations) at the Ministry of Manpower and was overseeing the investigation of fatal/ serious accidents. Dr Goh has experience in different industries including construction, manufacturing, shipyards and oil and gas. Dr Goh taught risk management, incident investigation and safety technology at post-graduate and undergraduate levels when he was Senior Lecturer at Curtin University, Australia. Dr Goh is currently an Adjunct Associate Professor with Curtin University and has a wide range of peer-reviewed papers in high impact scientific journals.
Title
Basics in designing ERSS

Abstract
An engineer is a professional practitioner of engineering, concerned with applying scientific knowledge, mathematics, and ingenuity to develop solutions for technical, societal and commercial applications. Engineers design structures and systems while considering the limitations imposed by practicality, regulation, safety, and cost. The work of engineers forms the link between scientific discoveries and their subsequent applications to human needs and quality of life.

As we strive to go higher, and dig deeper, the engineer has to delve into his engineering knowledge and expertise, and move into new frontiers. He can only be comforted that basic engineering remains the same – and that as long as he understands and appreciates basic engineering principles, he can apply his ingenuity to develop complex solutions to an ever changing world.

The talk goes back to the basic engineering for Earth Retaining or Stabilising Structure, which is any structural system or other means used to maintain the shape of excavation during construction, earth filling or cutting, and the application of instrumentation to ensure its performance. In an engineering system where the underground strata may not be as predicted, it is important to check and review the design as the works progress, and hence the important use of instrumentation.

CV
Er. Lim Peng Hong is a Professional Civil Engineer with 30 years of experience in structural, transportation, civil and geotechnical engineering in the region. He is registered in the specialized branch of geotechnical engineering under the Professional Engineers Board, and is a Specialist Accredited Checker for Geotechnical Building Works. He has been a member of the Singapore Professional Engineers Board (PEB) since 2009 and is the Immediate Past President of the Association of Consulting Engineers Singapore. He chairs the Engineering Services Academic Advisory Committee for ITE, and also the Technical Committee for Structures and Sub-structures in SPRING, besides being a member of the Building and Construction Standards Committee in SPRING. Besides managing infrastructure and building projects in Singapore, he has been involved in overseas projects, covering countries in both Asia and Europe. These include the supervision of 120 km of highway in Mizoram, India under a World Bank loan, concept design of the rail transit line for Bosphorus Crossing in Istanbul, 35-storey commercial building in Vietnam and a transportation study in Tianjin, China under World Bank Technical Assistance. Local projects include the Kallang Expressway, Circle Line, Downtown Line and major buildings like Supreme Court, Changi Prison and Khoo Teck Puat Hospital at Yishun.
He is currently the Managing Director of PH Consulting Pte Ltd, a licensed corporation under the Professional Engineers Act.
Title
Design of Industrial Rope Access Anchorages and Anchorage Lines : Back to Basics

Abstract
The Workplace Safety and Health (Work At Heights) Regulation 30 requires Professional Engineers to design and calculate for every anchorage and anchorage lines of an industrial rope access system. The audience will be brought back to the basic design concepts for industrial rope access systems. They will also gain awareness of the fundamental design parameters and their compliance to the corresponding design criteria in the legal requirements and Singapore Standards.

CV
HOE Yee Pin has been a trainer, consultant and practitioner in work-at-height for almost 10 years. He was trained in the UK in rope access, rigging at heights, advanced high-angle and confined space rescue. He holds a Competent Trainer in Fall Protection certification endorsed by the International Society for Fall Protection (ISFP) and was a licensed training representative for several height safety companies to deliver work-at-height and rescue training in Asia. He is also licensed by several manufacturers to install their fall protection systems such as permanent horizontal and vertical lifelines on buildings and structures. In addition, he is also a qualified Fall Protection Engineer and a qualified inspector and servicing technician for fall protection equipment.

Yee Pin is active in sharing his knowledge with his involvement in the Institution of Engineers Singapore (IES) Health and Safety Engineering Technical Committee (HSETC) and serving as a member of the work groups on Singapore Standards for industrial rope access (SS 588) and design of fall arrest systems.
Title
Construction work is hazardous. Can it be safe?

Abstract
Owing to the uniqueness of every construction project, the associated safety risks are considerably higher than other sectors, such as manufacturing which is under better controlled factory environment. This presentation discusses the hazards of construction works and the basic consideration to improve the safety in work place during construction phase. The management and the workforce have to recognise the inherent construction risks and to set effective policies and control measures to prevent accidents/incidents. Nonetheless, the challenges remain due to the diversity of different backgrounds of workforce, tight construction programme, high tolerance on perceived risks and competitive nature of the construction industry etc. The presentation also discusses the way forward in tackling these challenges by looking into the basic framework of the industry

CV
HC Chiang brings him with more than 28-year working experience in the local construction industry. He has involved in both building and infrastructural projects. Mr. Chiang has managed a few award winning projects including AIA Tower, C709 NEL MRT Station, One Raffles Link and C909 DTL Chinatown Station. HC Chiang was graduated from NUS and currently the General Manager of United Singapore Builders Pte Ltd.
Registration Form

Title : Seminar On Back To Basics In Engineering, Safety & Construction
Date : 21 May 2014, Wednesday
Time : 9.00am – 5.30pm
Venue : Orchard Hotel Singapore, 442 Orchard Road (238879)
CPD Programme : 7 PDUs, 7 SDUs & 6 STUs - Confirmed
Fees : $220.00 (IES Members) / $260.00 (Non-Members) / $ 235.00 (CIJC & WSHO)

Please register online/mail/fax the completed form by 14 May 2014 before 3pm to:
Karen Phua
70 Bukit Tinggi Road (289758)
Tel: 6463 9211 Fax: 6463 9468

Participant Details

Name : ___________________________ NRIC : ___________________________
Company : ___________________________ Designation: ___________________________
Address 1 : ____________________________________________
(For mailing of invoice and receipt)
Address 2 : ____________________________________________
(For mailing of Certificate, if address is different from above)
Postal Code : ___________________________ Sex : Male / Female
Tel : ___________________________ Fax : ___________________________
Email : ____________________________________________

Please indicate:

- IES members IES M’ship No.: __________ P.E. No.: _____________
- Non-members
- Affiliated members Org. Name: _____________ M’Ship No. ____________

Contact Person Details (if different from participant)

Name : ___________________________ Designation: ___________________________
Tel : ___________________________ Fax: ___________________________
Email : ___________________________

Payment Details

Bank / Cheque No.: ___________________________ Amount : ___________________________
* All Fees are inclusive of 7 % GST.
Cheque should be made payable to: “IES”

Acceptance of Terms and Conditions for Registrations of IES Academy’s Events

I agree to abide by the Terms and Conditions for Registration of IES Academy’s Events.

Name : ___________________________ Signature: ___________________________
TERMS & CONDITIONS COURSE REGISTRATION

Registration
Any registration, whether on-line or fax will be on a first-come-first-served basis and will only be confirmed upon receipt of full payment by The Institution of Engineers, Singapore (IES) unless otherwise invoice to company.
All registrations must be submitted with duly completed registration form.
Email registrations will not be accepted.

Closing Date & Payment
The closing date of the event will be 7 working days prior to event commencement date. Cheques should be crossed ‘A/C payee only’ and made payable to ‘Institution of Engineers, Singapore’ or ‘IES’, with the Title of The Event indicated clearly written on the back of the cheques, and submitted with the duly completed registration forms to:

IES Academy
70 Bukit Tinggi Road
Singapore 289758

Confirmation of Registration
Confirmation of registration will be given 5 working days prior to the commencement date via email. If you do not receive the said confirmation email, please contact IESA general admin immediately at 6463.9211 (office).
IESA reserves the right to allow only confirmed registrants to attend the Event.

Withdrawals/Refunds of Fees
Notice of withdrawal must be given in writing to IESA. Policy on refund of course fee is as follows:
- FULL refund if we receive your written notice of withdrawal at least 7 working days before the commencement of the Event.
- NO refund otherwise.

No show of participant would not be accepted as reason for withdrawal/refund.
Replacement is allowed but restrict to once only. However, when a member is replaced by a non-member, the participant has to pay the difference in the relevant fees applicable before the commencement date.

Cancellation/Postponement
Changes in Venue, Dates, Time and Speakers for the Events can occur due to unforeseen circumstances.
IES reserves the full rights to cancel or postpone the Event under such circumstances without prior reasons. Every effort, however, will be made to inform the participants or contact person of any cancellation or postponement.
Fees will be refunded in FULL if any Event is cancelled by IESA.

Enquiries
For further enquiries, please contact IESA general office at Tel: 6463.9211.