

# Two-Day Seminar on Forensic Engineering and Collapse Investigations: Technical and Legal Issues



by Ir. Assoc. Prof. Dr Chiang Choong Luin, Jeffrey

CIVIL AND STRUCTURAL ENGINEERING TECHNICAL DIVISION

**THE** Institution of Engineers, Malaysia (IEM) jointly organised a two-day seminar on forensic engineering and collapse investigation with the National University of Singapore (NUS) from 13 to 14 January 2011. The event was held at Holiday Inn Kuala Lumpur, located at Glenmarie, Shah Alam, Selangor.

The seminar was attended by 108 participants – many of them were senior engineers and managers of established local consultants and authorities. This was not surprising as forensic engineering is gaining prominence especially in light of a number of structural failures involving the collapse of buildings and infrastructures. Legal issues relating to litigation and arbitration are also on the rise and are increasingly being faced by the senior management of private engineering firms.

This was the second time the IEM Civil and Structural Engineering Technical Division had taken the initiative to co-organise a similar seminar with the Department of Civil Engineering of National University of Singapore (NUS). The last seminar was held at IEM in mid-2008.

The three prominent speakers for the event were Er. Prof. Dr Leung Chun Fai, Er. Prof. Dr Richard Liew JY (both from NUS) and Er. Prof. Dr Fred SH Ng (who hails from Hong Kong University and Davis Langdon and Seah Consultant, Singapore).

On the first day of the seminar, Dr Ng started off his lecture with a basic introduction to forensic engineering; from the handling of forensic cases, conducting proper investigations, careful analysis and ethical issues, up to the writing of a full and convincing report – which can

(To be continued on page 44)

Electrical Engineering Technical Division  
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**BEM APPROVED  
CPD/PDP HOURS:**  
Tutorial : 6.5 (tentative)  
Conference : 11 (tentative)  
Ref. No.: pending approval

Keynote Speakers



Dato' Loo Took Gee  
Secretary General, Ministry of Energy,  
Green Technology and Water,  
Malaysia



Prof. John Loughhead  
FREng FCGI CBE,  
Past President, IET



Dato' Ir. Azman Bin Mohd  
Chief Operating Officer,  
Tenaga Nasional Berhad,  
Malaysia



Ar Von Kok Leong  
President,  
Malaysia Green Building  
Confederation, Malaysia



Ir Ahmad Fauzi bin Hasan  
CEO,  
Energy Commission Malaysia

Plenary Speakers



Dr Eric Roberts  
United Kingdom



Ir Lee Keh Sai  
Singapore



Dr Ir Herman Dornel  
Indonesia



Dr Tilak Siyambalapitiya  
Sri Lanka



Dr Paul Casey  
United Kingdom



Matthias Gelber  
Germany



Ir. Al-Khairi Mohd Daud  
Malaysia



Ar Sarly Adre Sarkum  
Malaysia



Anthony J. Jude  
Asian Development Bank



Dr Volker Pickert  
United Kingdom



Dr Douglas Henderson  
United Kingdom



Allen Chen  
Taiwan



BK Sinha  
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Baptiste Kervyn  
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Ir Ali Askar  
Malaysia



Bernard Lee  
Singapore



Richard KL Tu  
Taiwan



SU, Jin-Sheng  
Taiwan



Daniel Wang  
Taiwan



Roger Chia  
Singapore



Ir J. Thirukumaran  
Malaysia



Chih-Chien Liang  
Taiwan



Kuo Tzu-chen-Liang  
Taiwan



Dr Gary Chang  
Taiwan

Tutorial Speakers



Dr Volker Pickert  
United Kingdom  
Green Technologies for  
Transportation Systems



Dr Douglas Henderson  
United Kingdom  
Renewable Based Distributed  
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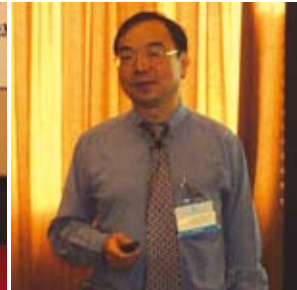




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Er. Prof. Dr Richard Liew JY



Er. Prof. Dr Leung Chun Fai



Er. Prof. Dr Fred SH Ng

then be used as key evidence in the courts and tribunals. In the later part of the morning and afternoon sessions, Dr Ng continued his lectures on the importance and origin of expert evidence, as well as the qualifications and duties of an expert witness. He gave a detailed account on the steps and procedures in presenting an expert witness and how the latter's role and conduct can have an impact on the outcome of a case. He also addressed in great depth issues revolving liabilities and professional fees.

The next speaker was Dr Leung who delivered his lecture on cases and problems associated with failures and investigation into geotechnical engineering. He identified the common causes, and outlined the design and construction steps with the view of implementing preventive measures so as to minimise the chances of soil and/or soil-structure interaction failures. Remedial measures were also mentioned to address soil failures which had occurred, and how future precautions can be put in place. Dr Leung ended the first day of the seminar with an intense question and answer session where many queries were raised by the participants.

On the second day, Dr Leung resumed his momentum on the case studies of geotechnical failure. He briefly related his first experience as an appointed expert witness in a court case. It was an enlightening experience for him as he took on the role and responsibility of an expert witness. The lessons learnt from such case studies were presented in a clear manner, and Dr Leung ended his lecture just in time for the morning tea break.

For the second half of the morning session, Dr Liew took over as the third speaker. His lectures focused on the failures in structural steel components and buildings. The common causes of failures in structures were highlighted, such as inadequate bracing, instability of joints and mistakes made during structural modelling. The procedures of forensic investigation were presented, which were similar to those portrayed in the CSI television series. Dr Liew also emphasised on the design, construction and monitoring of structures, particularly on structural integrity and robustness, in light of the Ronan Point gas explosion incident in the United Kingdom – which had the profession learning the hard way on the importance of structural dependence and the interaction of its many components.

After the lunch break, Dr Liew commenced the afternoon session by delving into the collapse investigation of a structural roof and the implication of lateral ties requirements. The lack of such ties had led to the separation of the wall and roof connections at the eaves. He provided some pointers on the problems associated with bolted connections and weld defects. Stability issues relating to cantilever structures were also addressed, particularly at the construction stage.

In the later part of the afternoon, Dr Liew focused on the case studies of investigations which he was personally involved in as an expert witness from two different angles. In the Nicholl highway collapse (due to deep sheet pile failure), he was an expert witness in the successful prosecution team. In the case of the Fusionpolis collapse, he was also on the winning side, but as an expert witness on the defense team.

Overall, the seminar proved to be very enlightening and useful for engineers involved in forensic investigations or involved in court hearings related to engineering failures and arbitration cases. ■