Geotechnical Workshops:

(1) Quantitative risk assessment: theory and applications to landslides, offshore geo-hazards and offshore foundations; dams and mine slopes

(2) Residual soils, slope stability and landslide

Organised by: **Centre for Infrastructure Engineering and Management and Griffith School of Engineering, Griffith University Gold Coast Campus**

Workshop 1: **February 16-17, 2009: Quantitative risk assessment: theory and applications to landslides, offshore geo-hazards and offshore foundations; dams and mine slopes**

Workshop 2: **February 18-19, 2009: Residual soils, slope stability and landslides**

Venue: Griffith University Gold Coast Campus: G30_ Rm 1.15

PLEASE NOTE THAT ONLINE REGISTRATION IS NOW AVAILABLE
https://www.conferenceonline.com/index.cfm?page=booking&object=conference&id=13203&categorykey=3F7B07D6%2D0606%2D4632%2D9B42%2DB79334AB5FEF&clear=1

See Online Registration Details Inside this Bulletin

For additional information please contact (preferably by e-mail)
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INTRODUCTION

In February 16- 19, 2009, two Workshops are arranged for geotechnical practitioners, academics and researchers on

(1) Quantitative risk assessment: theory and applications to landslides, offshore geo-hazards and offshore foundations; dams and mine slopes and

(2) Residual soils, slope stability and landslides

Workshop 1: Quantitative risk assessment: theory and applications to landslides, offshore geo-hazards and offshore foundations; dams and mine slope: Society and regulations require that the hazard and risk associated with engineered activities, especially in offshore structures, dams, and mine slopes be quantified. Almost all frameworks developed for quantifying the risk associated with natural hazards and constructed facilities aim at answering the following questions:

- **What are the probable dangers?**
  [Danger Identification]

- **What would be the magnitude and frequency of danger?**
  [Hazard Assessment]

- **What are the elements at risk?**
  [Elements at Risk Identification]

- **What might be the degree of damage to the elements at risk?**
  [Vulnerability Assessment]

- **What is the probability of damage?**
  [Risk Estimation]

- **What is the significance of the estimated risk?**
  [Risk Evaluation]

- **What should be done?**
  [Risk Management]

Quantitative Risk Assessment (QRA) comprises all the steps mentioned above. QRA is an important tool to account for uncertainties in a design and to assist the process of decision-making. Dealing with uncertainties in a quantitative manner requires a probabilistic approach. The probabilistic approach provides a rational framework for taking into account the uncertainties in an engineering design and evaluating the probability of non-performance or failure. Ultimately, the analyses contribute to decision-making and contingency planning. The course first presents hazard assessment in the context of QRA. The practical methods for doing probabilistic analyses, such as first-order, second-moment (FOSM) approach, first- and second-order reliability methods (FORM and SORM). Monte Carlo simulation techniques and event trees will be described.

The central part of the course is the application of the probabilistic approach in practice. Examples will be provided for slope instability on land, as well as examples from offshore

engineering including a piled foundation, a jack-up structure, a gravity foundation and stability of an underwater slope subject to earthquake loading.

DAILY PROGRAMME: Workshop 1: February 16-17, 2009: Quantitative risk assessment: theory and applications to landslides, offshore geo-hazards and offshore foundations; dams and mine slopes

Day 1: Monday, February 16, 2009: Dr Farrokh Nadim Quantitative Risk Assessment (QRA) – Theory and analytical methods

08:30 – 09:00am : Registration

09:00 – 10:40am : Terminology and QRA theory

10:40 – 11:00am : Coffee

11:00 – 12:30pm: Sources of uncertainty, Probabilistic analysis methods

12:30 – 01:00pm : Lunch

01:00 – 02:30pm: Probabilistic analysis methods (continued)

02:30 – 03:00pm: Coffee

03:00 – 05:00pm : Examples of QRA applied to landslide problems

Days 2: Tuesday February 17, 2009: Examples of QRA applied to offshore geotechnical engineering; Risk assessment and risk management of Dams and Mine slopes

08:00 – 09:00am: Registration

09:00 – 10:00am: Offshore piled foundation

10:00 – 11:00am: Offshore gravity foundation and jackup foundation

11:00 – 11:15am: Coffee

11:15 – 12:15pm: Offshore slope instability

12:15 – 01:00pm: Lunch

1:00 - 3:00 pm : Risk Assessment in Australian Dams
Malcolm Barker, GHD

3:00 – 3:30 pm : Coffee

3:30 - 5:00 pm : Risk Assessments of Steep Mine Slopes
Dr. John Read CSIRO

Workshop 2: February 18-19, 2009: Residual soils, slope stability and landslides

Intense Urban development in a hilly terrain with high seasonal rainfalls has always posed geotechnical challenges with massive landslides and multiple fatalities. Thus the now Geotechnical Engineering Office of the Civil Engineering and Development Department of the Government of Hong Kong was formed in 1977 as a central body to regulate the planning, investigation, design construction and maintenance of slopes. Over the years the key strategies of this body is to incorporate the latest technological advances in enhancing the stability of natural and man made slopes and in educating the public on the importance of slope stability. Concurrently the lessons learnt from slope failures have contributed to improved geotechnical design of slopes, systematic landslide investigations slope improvement techniques, quantitative risk assessment and mitigation and reduction of landslide hazards.

As such the Course begins with a description of the engineering geology of deeply weathered rocks resulting in thick layers of residual soils, their engineering properties and the effect of intense annual rainfall averaging to some 2,300mm and occurring within May to September in a year. It will then continue with important correlations of rainfall and their intensity with landslides as established from the vast amount of data collected over some three decades. Common types of slope failures and their methods of prediction will then be discussed. The role of field instrumentation and the monitoring of landslide prone areas will also be included and these will concentrate on the planning, calibration, installation, and monitoring of ground water level, pore pressures, surface movements, subsurface movements, loads and stresses.

Several case histories of landslides as documented over a period of thirty or more years will be summarised and presented with lessons learnt from them with a view to improve the understanding of slope stability and landslide hazard reduction. The landslip preventive measures (LPM) program as implemented since 1977 and the reflections on its achievement and advancement in upgrading the safety standards of slopes will then be presented.

A risk based approach using the data base of slope features posing risks and the land-use pattern has contributed to the effectiveness of risk mitigation. Results from quantitative risk assessment studies will also be included in the course.

Day 3 : Wednesday February 18, 2009: Residual soils slope Stability and Landslides -1

08:00 – 09:00am: Registration

09:00 - 10:30am : (a) Residual soils : Residual soils, colluvium, rainfall, developments with rising population, and landslides

(b) Topography and geology: Terrain and topography, geology, rocks and soils

(c) Rainfall: Weather and rainfall pattern, regional and local

10:30 – 10:45am: Coffee

10:45 – 12:15pm: Rainfall, slope stability and landslides: Relationships of rainfall and landslides, figures in the last 3 decades

12:15 – 01:00pm: Lunch

1:00 - 3:00 pm: Case histories of Landslides

3:00 - 3:30pm: Coffee

3:30 - 5:00 pm : Predictions of slope failures: Common types of slope failures ; modelling; Methods of predictions; Ground water measurements; Stress-strain behaviour of soils; Strength parameters; and other factors

Day 4 : Thursday February 19, 2009: Residual soils slope Stability and Landslides -2

08:00 – 09:00am: Registration

09:00 – 10:30am: Field instrumentation and monitoring in landslide prone areas (Planning, calibration, installation, monitoring; measurement of ground water level, pore pressures, surface movements, subsurface movements, loads and stresses)

10:30 – 10:45am: Coffee

10:45 – 12:15pm: Case Studies of Landslides

12:15 – 01:00pm: Lunch

1:00 - 3:00 pm: Reduction of Landslide Risk 1: the key areas adopted in the Slope Safety System include: improving slope safety standards, technology, and administrative and regulatory frameworks; ensuring safety standards of new slopes; rectifying substandard Government man-made slopes; maintaining all Government man-made slopes

3:00 - 3:30pm Coffee

3:30 - 5:00 pm Reduction of Landslide Risk 2 : Ensuring that owners take responsibility for slope safety; and promoting public awareness and response in slope safety through public education, publicity, information services and public warnings

Griffith UNIVERSITY

Registration Can Now Be Done Online

Geotechnical Workshops:

(1) Quantitative risk assessment: theory and applications to landslides, offshore geo-hazards and offshore foundations; dams and mine slopes

(2) Residual soils, slope stability and landslide experiences from Hong Kong

ON LINE REGISTRATION AND PAYMENT:
https://www.conferenceonline.com/index.cfm?page=booking&object=conference&id=13203&categorykey=3F7B07D6%2D0606%2D4632%2D9B42%2DB79334AB5FEF&clear=1

(A) SIMPLY FOLLOW THE LINK; YOU WILL BE REQUIRED TO FILL IN YOUR DETAILS AS BELOW:

First Name:
Last Name:
Preferred First Name:

Organisation:

Contact phone:
Fax:
Contact email:

Address:
City/Suburb:
State/Country:
Postcode/Zipcode:
Country:

***Please note that password is also required. You will use this password to log into the User Admin area and modify your registration if necessary.**

(B) BY CLICKING "NEXT STEP", YOU WILL BE ABLE TO SELECT THE MODULE YOU INTEND TO ATTEND.

- □ **AUD $ 490 - Monday, 16th February 2009**
- □ **AUD $ 490 - Monday, 17th February 2009**
- □ **AUD $ 490 - Monday, 18th February 2009**
- □ **AUD $ 490 - Monday, 19th February 2009**

By ticking the box, you are now registered for the days you selected.

(C) PLEASE CLICK "NEXT STEP" AGAIN, YOU WILL NOW ABLE TO SELECT THE PAYMENT METHOD YOU WANT TO USE. THESE INCLUDE:

- □ **CREDIT CARD (VISA/ MASTERCARD/ AMEX)**
- □ **CHEQUE**
- □ **DIRECT DEPOSIT (EFT)**

(D) AFTER YOU FILLED IN ALL THESE DETAILS, YOU ARE NOW REGISTERED IN THE WORKSHOP BY CLICKING THE "SUBMIT" BUTTON. AN INVOICE WILL BE SENT TO YOUR EMAIL DIRECTLY.

***For additional information please contact (preferably by e-mail)**
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Biodata of Speakers

Professor Farrokh Nadim : Dr Nadim is the director of the Centre of Excellence, the "International Centre for Geohazards" (ICG), at the Norwegian Geotechnical Institute (NGI). He has a BSc in structural engineering from Sharif University of Technology in Iran, and MSc and ScD degrees in civil engineering from Massachusetts Institute of Technology (MIT). Dr Nadim came to NGI in 1982 on a post-doctoral fellowship and joined NGI as a fulltime employee in 1984. His major fields of work are related to landslides and geohazards, risk and reliability analysis, geotechnical earthquake engineering, behaviour of geotechnical structures under cyclic and dynamic loading, and offshore foundation engineering. He is author or co-author of over 90 scientific publications, and Chair of Technical Committee 32 of ISSMGE: "Engineering practice of risk assessment and management". Since 2003 Dr Nadim has been an adjunct professor at both the Norwegian University of Science and Technology (NTNU) and University of Oslo, Norway. Dr Nadim is on the editorial boards of Georisk and Landslides.

Malcolm Barker: Malcolm has 33 years experience in the design, construction and safety of dams and canals and their associated works. This work has included Feasibility, Design, Construction, Safety Review and risk analysis of dams in Zimbabwe, South Africa, Canada and Australia. Malcolm has served on the working group for the preparation of the ANCOLD guidelines for Hazard Assessment and Risk Assessment and the ANCOLD Consequence Guidelines. In Australia, Malcolm carried out a number of detailed risk assessments for dams including the following more significant projects: Thomson Dam (Melbourne Water) ; Cairn Curran Dam (Goulburn Murray Water) ; Rocklands dam risk assessment (Grampians Wimmera Mallee Water Authority) for safety evaluation and identification of potential remedial options; Eildon Dam (Eildon Alliance) risk assessment for the embankment design options including spillway gate reliability and the effect on reservoir level and failure probability; Blue Rock Dam (Southern Rural Water) risk assessment for a 74m high central core rockfill dam.

Dr. John Read : Dr Read has 40 years experience as an engineering geologist in civil and mining engineering. He spent his early years working in Papua New Guinea with the Bureau of Mineral Resources (now Geoscience Australia) as a project engineering geologist on the investigation and construction of hydro-electric schemes, new roads and village water supplies. Later, he worked with the geotechnical engineering consultants Coffey & Partners Pty. Limited on water supply dams, highway investigations and mining infrastructure projects throughout Australia, Papua New Guinea and Indonesia. From 1977 to 1980 he was Superintendent Engineering Geologist at the Melbourne and Metropolitan Board of Works and from 1980 to 1984 the Superintending Engineering Geologist at the Bougainville Copper Mine in Papua New Guinea.

In 1984 Dr. Read moved to Purdue University, where in 1987 he completed his PhD studies in Geotechnical Engineering. He then worked with the geotechnical engineering consultants Golder Associates Inc on USDOE programs for the underground disposal of nuclear waste in Washington State and Texas, and on slope stability and open pit metalliferous mine design tasks in North and South America.

In 1990 Dr. Read returned to Australia to commence his own geotechnical engineering practice, specialising in slope stability and open pit mine slope design work with projects in Australia, Fiji, Papua New Guinea, North and South America, South Africa, and Zambia. In 1994, he accepted a contract appointment with CSIRO as Deputy Chief, CSIRO Exploration & Mining and

Executive Manager and CSIRO spokesperson to government and industry for the Queensland Centre for Advanced Technologies laboratories at Pullenvale, Brisbane. In 2004 Dr Read stepped back from both of these positions to establish a CSIRO mining industry funded research project (the LOP Project), which is directed at improving our ability to predict the reliability of rock slopes in large open pit mines.

Dr Tam Heng-kong : Dr. Tam Heng-kong obtained his M.Eng. and Ph.D. degrees respectively from the Asian Institute of Technology, Bangkok in 1981 and the City University, UK in 1992. He now works as a Senior Geotechnical Engineer in the Public Works Central Laboratory, Geotechnical Engineering Office of the Civil Engineering and Development Department, Government of the Hong Kong Special Administrative Region. He has geotechnical experience in many countries since 1981, including Singapore, UK, Australia before joining the HKSAR Government in 1995. Over the last 13 years, Dr. Tam is most active with the Landslide projects in GEO. The Public Works Central Laboratory is very well equipped for testing of residual soils. Some of the major landslides in Hong Kong are listed below:

18 June 1972 : Sau Mau Ping and Po Shan Road landslides
25 August 1976: Sau Mau Ping landslide
8 May 1992: The Baguio landslide
16 June 1993: Cheung Shan Estate landslide
23 July 1994: The Kwun Lung Lau landslide
13 August 1995: Shum Wan Road and Fei Tsui Road landslides
2 July 1997: Ten Thousand Buddhas' Monastery landslide
22 August 1999: Sham Tseng San Tsuen debris flow
April 2000: Tsing Shan debris flow
1 September 2001: Lei Pui Street landslide
20 August 2005: Fu Yung Shan landslide
7 June 2008: Tung Chung natural terrain landslide affecting North Lantau Expressway; Tai O natural terrain landslides