55TH RANKINE LECTURE

Wednesday 18th March 2015 at 5.30 pm

The Great Hall, Sherfield Building, Imperial College London, Exhibition Road, SW7 2AZ

Hazard, Risk and Reliability in Geotechnical Practice

Dr Suzanne Lacasse

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ABSTRACT

More and more, society requires to know the risk which people, property and the environment are exposed to. The role of the geotechnical engineering profession should increasingly be *r*educing exposure to threats, reducing risk and protecting people.

The objective of the 55th Rankine Lecture is to convince you that you can implement, with benefit, concepts of hazard, risk and reliability to assist you in design, decision-making and engineering recommendations. After an overview of the basic concepts, the lecture discusses the advances of hazard, risk and reliability in geotechnical engineering, and explains several "real life" case studies. In these examples, specific engineering questions had to be answered, and risk and reliability applications provided insight for informed decision-making. The factor of safety remains the main indicator of safety in practice, and its significance and that of key parameters used for design, e.g. the characteristic strength, are discussed. The examples presented are taken from a wide realm of geotechnical problems, including the selection of soil properties, the mapping of hazard and risk, as well as hazard and risk assessment associated with slope stability, dams, offshore installations and code calibration. The contributions of risk assessment and management to geotechnical engineering, the strengths and drawbacks of the approach and issues such as tolerable and acceptable risk, perception of risk and cascading hazards are discussed. The lecture shows how interaction with other disciplines is part of providing a soundly engineered solution.

The geotechnical engineer's role is not solely to provide judgment on selection of parameters, methods of calculations and resulting safety, but also to take an active part in the evaluation of hazard, vulnerability and risk.

Dr Suzanne Lacasse is Canadian and lives in Norway. She is Technical Director at the Norwegian Geotechnical Institute (NGI). She was Managing Director of NGI from 1991 to 2011. Dr Lacasse first focused her work on laboratory techniques, *in-situ* investigation methods and soil behaviour modelling studies. She then worked on foundation engineering and design, slope stability and the development of calculation procedures for offshore structures. She concentrated on combining mathematical and numerical analyses with practical geotechnical engineering design methods. She then developed and applied probability, reliability and risk concepts to assist in foundation design and decision-making. She gave invited keynote lectures in over 30 countries, and she is author or co-author of 300 papers. She gave ASCE's 37th Terzaghi Lecture on Offshore Geotechnics (2001) and ISSMGE's 8th Terzaghi Oration on Slope Stability (2013). Dr Lacasse received many awards, including PhDs *Honoris Causa* from the University of Dundee and from the Norwegian University of Science and Technology. She was elected Foreign Member of the US National Academy of Engineers (2001) for "enlightened direction of NGI and advancements in foundation engineering for offshore structures". She received the Legget Award of the Canadian Geotechnical Society and the first Effective Teaching Award in Civil Engineering at MIT. She is member of the Royal Society of Canada, the Canadian Academy of Engineers, l'Académie des Sciences Technologies (France), and the Academy of Engineering and Sciences and the Academy of Sciences and Letters in Norway. She is Honorary Professor at Zhejiang University in China.

This event will be broadcast online, details for which will be issued to BGA members by email prior to the meeting

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Advance booking for lecture not required
Tea & biscuits available: 5.00 – 5.30 pm

DINNER tickets sold separately from Wednesday, 14th January 2015

For queries please contact the BGA on 020 7665 2007 or email: bga@britishgeotech.org.uk

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