



**DEPARTMENT
OF
CIVIL ENGINEERING**



You are cordially invited to a seminar organized by Center for Offshore Research and Engineering, CORE and Department of Civil Engineering, NUS on

From Piles To Wellbore Stability (Applications of Geotechnical Analyses in Offshore Exploration and Production)

by

Andrew J. Whittle

Professor of Civil & Environmental Engineering
Massachusetts Institute of Technology

Date: Wednesday , 6 May 2009
Time: 4.30 pm – 6.00 pm
Refreshment will be served at 4.15 pm.
Venue: EA-02-11, Faculty of Engineering,
National University of Singapore

Abstract

This lecture describes how the improved understanding and modeling of soil behavior has been applied in three related applications for the offshore oil industry. The original development of a generalized effective stress soil model, MIT-E3, was motivated by the need to understand and predict pile-soil interactions for tension piles used to anchor floating production systems.

Numerical analyses of pile installation and set-up were then validated using instrumented model piles. Similar techniques of analysis have been used to design and interpret pore pressure and flow properties using a tapered piezoprobe device. The results have again been carefully validated through a unique program of field dissipation experiments. Refined versions of the piezoprobe are now widely in used by both the oil industry and Deep Sea Drilling Program to measure in situ pore pressures. Current research is focused on wellbore stability for drilling high angle wells through unconsolidated sediments. This provides a third application where the soil modeling is critical for understanding deformations in clay materials. This work has led to new understanding of clay behavior at high effective consolidation stresses. The talk will present recent validation of the analyses using results of laboratory Thick-Walled Cylinder (model borehole) tests.

About the speaker



Andrew Whittle is a Professor of Civil and Environmental Engineering at the Massachusetts Institute of Technology. His main research interests relate to the development of constitutive models and their application in predicting the performance of foundations and underground construction projects. His research has been widely used in the design of foundation systems for deepwater oil production facilities in the Gulf of Mexico. He has worked extensively on problems of soil-structure interaction for urban excavation and tunneling projects. He is currently based in Singapore as the lead PI for a major MIT research initiative on 'Environmental sensing and modeling' (<http://censam.mit.edu>). Dr Whittle received his Sc.D in Geotechnical Engineering from MIT in 1987, where he was also a John F. Kennedy Scholar (1982-1984), and his B.Sc (Eng.) in Civil Engineering from the Imperial College of Science and Technology, London in 1981. He joined the MIT faculty in 1988 and was promoted to full Professor in 2000. Dr Whittle has published more than 120 papers in refereed journals and conferences, and received several awards for his work from the American Society of Civil Engineers. He is a licensed professional engineer in New York State.

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Location Map of Seminar Venue

