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

Spudcan-Pile Interaction

by

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Date: Wednesday, 03 April 2013
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

Jack-up rigs are commonly employed to perform offshore oil and gas drilling. A jack-up rig is founded on spudcans and cantilevered over an adjacent jacket platform to drill new wells or workover existing wells. During spudcan installation, large volume of soil is displaced and consequently severe stresses may be induced on piles supporting the jacket platform. The increasing numbers of jack-up rigs being deployed at close proximity to piled platforms accentuates the need for research into quantifying the effect of spudcan penetration on adjacent piles. With the aim of improving the understanding of spudcan-pile interaction at a more fundamental level, five companies have funded the Spudcan-Pile Interaction Joint Industry Project. Extensive experimental and numerical studies were performed at the National University of Singapore to investigate the interaction between a spudcan foundation and the adjacent piled foundation supporting the permanent jacket platform in soft clay during the installation and extraction processes.

This seminar will focus on the numerical simulations of spudcan-pile interaction. Accurate assessment of lateral pile responses necessitate the simulation of continuous spudcan penetration which is beyond the capability of conventional Lagrangian based finite element approach. A novel Eulerian finite element technique was successfully adopted for this purpose. The numerical model was first validated against the centrifuge experimental results under different geometric configurations and soil profiles. Extensive parametric studies were then conducted to supplement the experimental data. This numerical approach can be readily applied to perform site-specific assessment to mitigate the risks associated with spudcan-pile interaction.
About the speaker

Dr THO Kee Kiat is currently a senior research fellow in the Department of Civil and Environmental Engineering, National University of Singapore. Upon completing his PhD at NUS in 2005, he practiced as a geotechnical engineer in the industry for two years before commencing the current appointment. His research interests include numerical simulation of penetration problems in offshore geotechnics and soil-structure interaction. Dr Tho has published over 10 international journal papers as well as a number of conference papers. Over the past few years, he has contributed his expertise in several marine and offshore geotechnical projects as member of the consultant panels.

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Location Map

Seminar Venue: EA-02-11