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WEDNESDAY, 18 SEPTEMBER 2019

"STUDY OF DRAG FORCE ACTING ON VARIOUS TYPES OF DP JACK-UP VESSEL LEGS"

By

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Meeting to be held at
Lloyd's Register, 71 Fenchurch Street London EC3M 4BS
at 17:30 for 18:15 hours (duration approximately 1 hour)

Dynamic Positioned (DP) Jack-up vessels currently use two popular designs of legs, (i.e. rack & chord lattices and cylindrical leg type). Various experiments have previously been conducted on the two leg designs to evaluate the drag coefficient and drag force of these legs, but they are only available in a steady state condition. The intention of our experiment is to measure the drag force and compare with CFD results. A mathematical model of the vessel is used to first estimate the environmental force acting on the vessel, by using real time sensor data and then generate the counter balance thrust. The output command of force and angle is then sent to the available thrusters. However, usually, DP Jack-up vessels do not have a sensor to measure the hydrodynamic force of leg & spudcan. Presently, each DP control system manufacturer for Jack-up vessels uses its own mathematical technique to achieve stability of station, during Simultaneous Operation (SIMOPS). of dynamic positioning and Jacking operation Moreover, this sensor less DP system tuning is unknown to the industry. The intention of these experiments is to measure the hydrodynamic forces, in order to understand how the evaluated forces is altered under different environmental and operational conditions in SIMOPS operation. To start with, we first decided to measure drag forces when leg & spudcan moves in a UP/DN direction under variable environment current. Both CFD and tank experiments are completed using a 3D prototype scale model of a cylindrical leg. The experimental limitations are also defined based on the tank facilities. The data is recorded during lowering and raising of the leg to see the effect on the drag force of leg-spudcan. The experimental data for current, leg speed; drag forces etc is recorded, in respect to time and average value considered for a steady state experimental case period. The evaluated results are compared with CFD results and show similar trends with acceptable error. CFD analysis is also carried out on a full-scale leg diameter to see the drag force trends, in order to understand the effect of seabed on the overall hydrodynamic force, cases were studied in which the leg was kept just a 0.1 m above seabed.

ALL ARE WELCOME

PLEASE CONTACT THE HONORARY SECRETARY, MS. LOURDES ELONA-LILLEY, FRINA AT london.rina44@gmail.com FOR BOOKING AND ADVISE IF A CONTINUING PROFESSIONAL DEVELOPMENT (CPD) CERTIFICATE IS ALSO REQUIRED.

PRE-BOOKING IS ESSENTIAL PLEASE RSVP AND CIRCULATE.