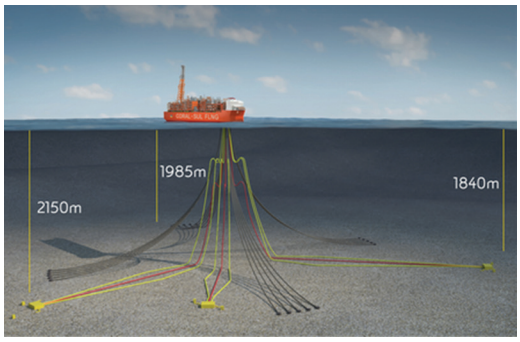
THE UNIVERSITY OF WESTERN AUSTRALIA

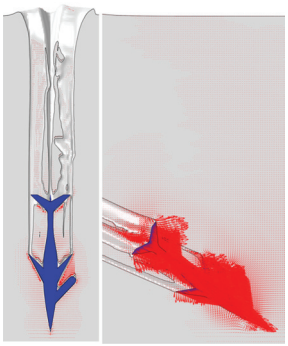
Faculty of Engineering and Mathematical Sciences

Centre for Offshore Foundation Systems
Oceans Graduate School

PhD Opportunity

Australian Research Council (ARC) Future Fellowship FT190100735 (May 2020- May 2024)
Game changing anchoring solution for Australia's deep water gas development
Future Fellow: A/Prof Muhammad Shazzad Hossain
Team: Dr Youngho Kim, Dr Shiaohuey Chow, Dr Dirk Rijnsdrop, PhD and Honours Students





I have been awarded a very prestigious Fellowship that is looking for high calibre PhD students to join the team. This Fellowship aims to establish a novel dynamically installed anchor shape for economic and safer mooring of floating gas drilling platforms in Australia's deep water calcareous seabed. The novel anchor pairing with the advanced floating platforms are expected to allow for unlocking Australia's 50% gas reserves that are considered to be stranded. This Fellowship expects to extend a sophisticated numerical analysis technique and a soil constitutive model, and use field testing in the Swan River and centrifuge modelling for extensive investigation on the novel anchor shape, leading to calculation methods for assessing the anchor embedment during dynamic installation and capacity under operational monotonic and cyclic loadings.

Aim 1: Develop a novel dynamically installed anchor shape that will embed deeply in calcareous seabed sediments during installation, and penetrate further (i.e. dive) under operational loadings, leading to adequate capacity.

Aim 2: Develop calculation methods and geotechnical design guidelines for assessing the anchor embedment depth during dynamic installation, and capacity under operational loadings – will be coded in a software.

Challenging and exciting methods

Numerical analysis:

- Extension of a soil constitutive model to capture strain rate dependency and dilatancy
- Total stress and effective stress large deformation finite element analyses
- Dynamic installation and performance under operational loadings
- CEL and RITSS techniques in ABAQUS

Centrifuge tests:

- At 150g in a beam centrifuge (NGCF)
- Dynamic installation and performance under operational loadings

Field tests:

- In the Swan River
- In East Perth and near Como foreshore
- In 4 to 5 m water depth
- Dynamic installation and performance under operational loadings

Water tank tests:

- In a 8 m high water tank
- At Dalian University of Technology, China
- Vertical installation of model anchor and chain
- Anchor verticality and drag coefficient

National collaborations

- Prof John Carter (The University of Newcastle)
- A/Prof Majid Nazem (RMIT University)
- Soil constitutive model
- Numerical analyses

International collaborations

- A/Prof Zhongtao Wang (Dalian University of Technology, China)
- Daewoo Shipbuilding and Marine Engineering Co Ltd, Korea
- Samsung Heavy Industries, Korea
- Water tank test
- Field monitored data in terms of loading conditions experienced by the mooring chains of floating facilities at the seabed level during calm weather and storm event

Scholarship information

Prospective students may contact A/Prof Muhammad Shazzad Hossain at muhammad.hossain@uwa.edu.au with a copy of: resume/CV; full academic transcripts; a copy of research thesis; details of any published papers; results of English tests, e.g. IELTS Academic, TOEFL

The successful candidates will be invited to apply for a Research Training Program and/or International Postgraduate Research (annual tax-free AU$30,000) scholarship.

For information on scholarships and to apply visit http://www.scholarships.uwa.edu.au/future-students/postgrad

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