

Jackup footprint, punch through studies underway

THE IADC SOUTH East Asia Chapter invited the **Global Maritime - Fugro Alliance** to give presentations on two subjects during their meeting held on 6 September 2002, at the Keppel FELLS Golf Club, Singapore. The following is from those presentations.

The Global Maritime-Fugro Alliance is managing a joint industry funded project to investigate and reduce the problems associated with jackup drilling rig installations at sites where other rigs have previously operated.

IADC is not endorsing nor participating in the JIP.

During jackup installation there is often a tendency for the spud cans to move towards the locations of the previously installed rig or rigs.

Such movements can result in structural damage, both to the rig and the existing infrastructure on the installation site; unsatisfactory positioning often with significant lost time and cost implications; and potential injury to personnel.

The project aims to reduce the unpredicted occurrence of these adverse movements by developing a Best Practice Guideline document, which will be published following project completion. The project is being funded by a group of 10 participants.

Spud can-footprint interaction issues appear to be increasing in frequency, and this is thought to be due to:

- Increasing reliance on jack-ups for drilling and work-over activities for unmanned and sub-sea facilities
- Increased jack-up tender-assist operations
- Expanding jack-up operational areas due to increased environmental capabilities
- Operators wishing to protect their commercial position by maintaining a range of rig options and hence a choice of jack-ups for use at a single location
- Reduced installation period (in some cases rigs may be on location for as little as 10 days at a time), giving increased opportunities for alternative

units to operate over the individual field lives

The study is divided into three phases.

PHASE I

- Collect data on incidents from participants
- Develop questionnaire to be used for collection of incident data worldwide
- Distribute questionnaire and interview key industry personnel
- Collate all of the results from the data-collection phase
- Build web-site database
- Determine appropriate methods of mitigation for review in Phase II
- Identify further research objectives identified for Phase II and III

PHASE II

- Investigation and optimization of a range of mitigation methods considered
- Performance of a range of calculations, front end Analysis and physical model testing, as appropriate, to optimize methods

PHASE III

- Use Phase I and II results to develop procedures for safe jack-up emplacement
- Conduct cost-benefit analyses for the range of applicable methods
- Produce a detailed report and procedures for design to enable safe jack-up
- Emplacement at locations adversely effected by spud can/footprint interaction

The second presentation was SE Asia jack-up punch-throughs: The way forward?

There appears to be some ambiguity regarding the term punch through and in order to address this the following definition was proposed:

“An unexpected jackup footing rapid settlement resulting in consequential lost drilling time.”

Unexpected Rapid Leg Penetrations (or “leg runs”) occur more frequently than punch throughs during jackup installation. The following definition was proposed:

“Unexpected rapid jackup footing settlements not resulting in consequential lost drilling time”.

S.E. Asia Punch-Through Situation

This region is known to have a fairly wide occurrence of punch-through hazards, but even so it has been estimated that perhaps as little as 30-50 % of punch-throughs are formally reported.

The actual situation is likely to be significantly worse than published reports or databases may suggest.

Presently it is estimated that in the Southeast Asia operating area typically one or two major punch-throughs are occurring each year, together with about 10 to 12 unexpected rapid footing penetrations.

The punch-through incidents are typically costing between about \$1 million and \$10 million.

Initially the companies propose to focus on the formalization of geotechnical site investigation requirements and procedures in order to reduce punch-through risk and increase offshore safety in Southeast Asia, and suggest that a two-year study should be considered with the following distinct phases:

PHASE I

Investigate historical Southeast Asia punch-through cases and borehole data to identify geographical, geotechnical and operational trends.

PHASE II

Development of a “best practice” guideline for jackup site assessment, including recommended scope of work together with advice on bearing capacity prediction methods and installation procedures based on current knowledge.

PHASE III

Research Phase 2 topics to develop the science and feed back into the Recommended Practice. ■