

### The 4G's in Practice:

## Investigating how the 4 G's are applied in the Oil & Gas Industry

Wednesday, 14 August 2013

Parmelia Hilton Hotel (Swan Room), Mill Street, Perth

**Registration** 5.30 pm: Presentations 6.00 pm – 7.30 pm Networking over drinks and finger food 7.30 pm – 9.00 pm

Chaired by: **Andy Lane, Principal Geohazard Analyst, Woodside Energy Ltd.**

#### **Geophysics & Port Developments – Exploring Marine and Transition Zones**

##### **Dr Kathleen McMahon, Senior Geophysicist, GroundProbe**

Geophysics is a useful tool for pre-development investigations in the marine environment and within the onshore/offshore transition zone. For pre-dredging and port infrastructure developments, geophysics can assist in mapping lithology and estimating material volumes, as well as providing geophysical properties of use for engineering assessments.

#### **Geomatics - How Deep? Rationalising Datum Differences From Multiple Surveys: A Case Study**

##### **Magnus McNeil-Windle, Senior Principal Geophysicist, Advanced Geomechanics**

When a number of coincident or overlapping depth sounding surveys are conducted over a period of time, discrepancies can occur between the depth measurements between them. These discrepancies can be related to the different datum's used for each survey and the use of predicted and observed tides, as well as dataset specific acquisition and processing artefacts. If these datasets are to be used for infrastructure development, the datum issues in particular need to be understood and rationalised. This presentation, using a case study, will examine the practical factors that contribute to the discrepancies and how the issues of datum and data processing can be resolved to provide the best representation of water depth for a development project.

#### **Geotechnics - Ensuring Consistency in Field Reports for Large Ground Investigations**

##### **Matthew Tutton, Principal Engineering Geologist, Golder Associates Pty. Ltd.**

One of the key challenges on large multi-disciplinary projects with diverse field teams is ensuring a standardised approach to field reporting and material description. This presentation discusses the approach adopted by Golder Associates to ensure consistency in field reports for a large geotechnical investigation comprising approximately 5,000 m of nearshore and onshore drilling, 88 test pits and over 10,000 laboratory tests carried out by field engineers and technicians from nine different offices across Australia, New Zealand and the USA.

#### **Geology - Sediment Transport on the Continental Shelf – Science and Practical Considerations**

##### **Piers Larcombe, Chief Sediment Scientist, RPS MetOcean**

Using a specific case study, this presentation will introduce the dynamic oceanographic and sedimentary setting, at a range of timescales. It will note the relevance of sediment transport to various projects stages and infrastructure, including pipelines and port developments in coastal environments.. It will describe the key sedimentological aspects and unknowns, including effects on and disruption to coastal sedimentary regimes. The talk will also consider the practical considerations for applied sedimentology for infrastructure projects.

#### **The 4G's in Practice: A Case study**

##### **Dr Steve Tyler, Principal Geophysicist & Dr Ian Finnie, Director, Advanced Geomechanics**

Geology, Geotechnics, Geophysics and Geomatics, when effectively blended and used together to produce an accurate geological model, lay the foundation to effective and optimal engineering. Engineering can of course proceed with the G's viewed independently, but opportunities to optimise can not then be realised, and the risks of unknown-unknowns tend to creep in. This presentation illustrates how the 4G's and other data were combined in an integrated study of a highly complex seabed and gives snapshots of what analyses were done and what the eventual geological model looked like. This data includes seismic reflection, refraction, geological and paleontological logging, in-situ testing and drilling energies. Some examples are then provided of how the engineering leveraged off this improved understanding to optimise the design and construction.

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