

Advances in Geotechnical Seabed Drilling & Testing with ROVDrill Mk.2

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Canyon Offshore

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CONTENTS

- History
- Development
- Configuration
- Record
- Lessons
- Today

History

Mineral Exploration, Papua New Guinea 2007 & 2008



Development

- Geotechnical capability
- High quality
- Deep-water capability
- Equivalent or better to drill-ships:
 - Drilling Fluid
 - Push/Piston Sampling
 - In situ Testing

TECHNICAL DATA SHEET



Recommended Treatment	Agitate Liquid
Pure-Bore® Liquid Mixing Ratios	Constr. Uncor.
Pure-Bore® Liquid Degradation	Calcul.
Packaging	Pure-I

The information and data contained herein are based on laboratory testing and field experience. Clear Solutions International Limited makes no warranty of any kind and accepts no responsibility for the results obtained.

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WATER BASED FLUIDS



...drilling ... Pure-Bore® ... shale ... range

...ions.

...of an engineering grade bentonite or ... n be added to retard biodegradation).

* Liquid polymer to settle out drilled ... at a sewage treatment works leaving

and agitate/circulate until Pure-Bore®

lbs/100 US gal	3.3 - 8.3 lbs
kg	5.0 - 10.0 lbs
kg	0.8 - 2.5 lbs

drums

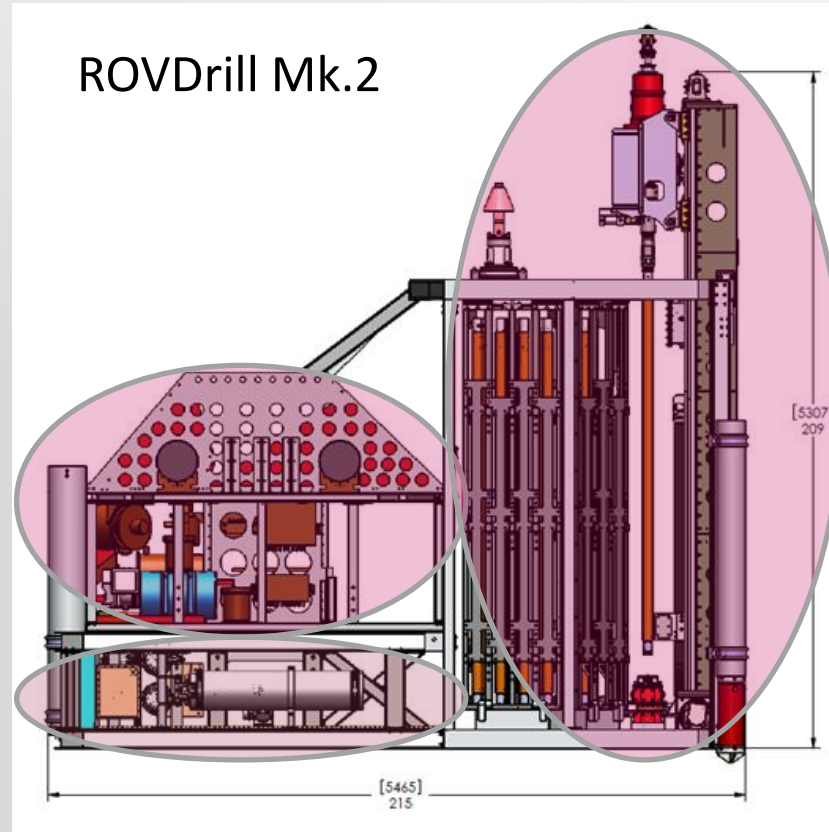
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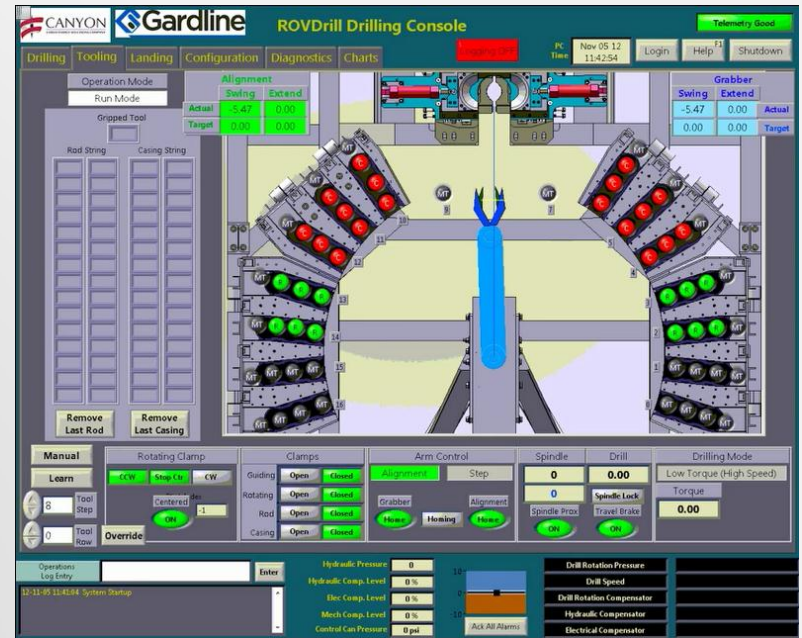
Configuration

200HP

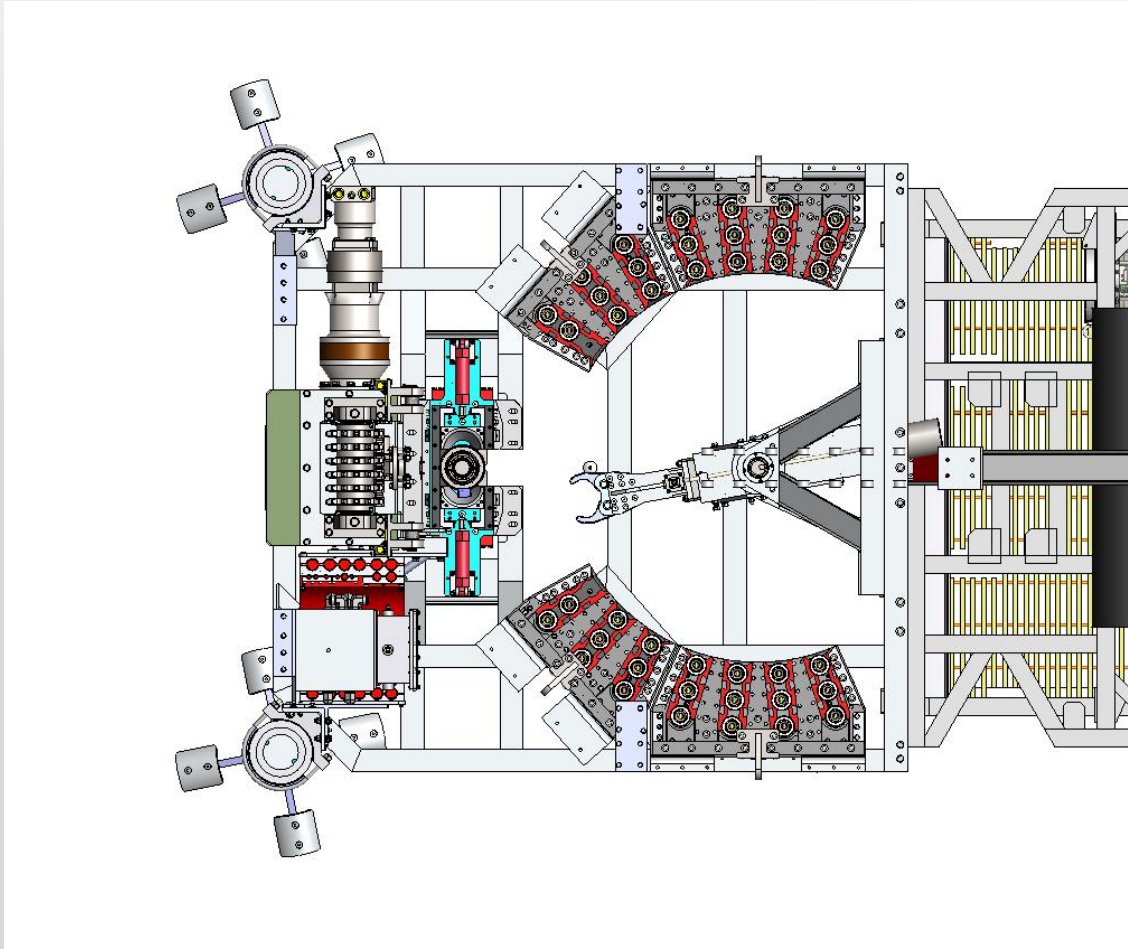


Drill Tower
&
Tool Racks

- Controls



- Tool-Racks (1)



- Tool-Racks (2)



Track-Record

No.	Client	Date	Location	Vessel	Borehole Description	Geotechnical Conditions	Max Water Depth (m)
5	E.ON Climate & Renewables UK	March 2012	Humberside, North Sea	Stril Explorer	<ul style="list-style-type: none"> • 2no continuous CPT BH's to 35m • 1no continuous CPT BH to 41m 	Variable; medium dense sand, soft clay, and structureless chalk to gravel, hard clay, and competent chalk.	25
4	EnQuest Britain Ltd	March 2012	Blocks 30/24 & 30/25, UKCS, North Sea	Stril Explorer	<ul style="list-style-type: none"> • 2no continuous CPT BH's to 25m • 1no composite BH to 56m • 2no sampling BH's to 36m • 2no composite BH's to 40m 	Sand overlying soft to hard clay and localised channel features	75
3	E.ON Climate & Renewables UK	February-March 2012	Humberside, North Sea	Stril Explorer	<ul style="list-style-type: none"> • 3no continuous sampling BH's to 40m, including rock coring 	Variable; medium dense sand, soft clay, and structureless chalk to gravel, hard clay, and competent chalk.	25
2	E.ON Climate & Renewables UK	Q4 2011	Humberside, North Sea	Stril Explorer	<ul style="list-style-type: none"> • 13no continuous CPT BH's to 35m • 15no continuous CPT BH's ranging from 10m to 20m. 	Variable; medium dense sand, soft clay, and structureless chalk to gravel, hard clay, and competent chalk.	25
1	Nautilus Minerals	2007 / 2008	Papua Guinea / Tonga	Wave Mercury / Norsky	<ul style="list-style-type: none"> • 96 BH's cored to a depth of 20m. 	Very weak to very strong volcanic sulphide deposits.	2,000

Benefits to Middle-East Offshore SI

- Typical deposits:
 - Layers of siliceous carbonate SANDS and calcareous CLAY with thin layers of CALCARENITE over a layer (3m+) of CALCARENITE. Under the CALCARENITE the layers of SAND and CLAY continue.
- Requirements:
 - To obtain good quality cores of calcarenite and then switch back to push sampling once through layer
- ROVDrill
 - Can sample with the sample tools either the push sampler or liner sampler at 85mm sample until the calcarenite layer is met. On meeting the sample layer we can switch to the dedicated thin kerf coring barrel, the cutting edge can be selected to match the precise formation being drilled.
- We have a seabed based system, not requiring large diameter (heavy) drill string, means
 - greater control of rotation, torque and in particular bit weight compared to heave compensated drilling.
 - This control allows the changes in layers to be detected and for drilling to be stopped and changed to CPT / sampling immediately such as the end of the calcarenite layer going into sand.
 - Depth registration is also more accurate on a seabed based system.
 - The ROVDrill has the option to use casing which could be beneficial in the running sands often encountered
 - Tailored mud will reduce the chance of washout whilst the sample is being recovered from the borehole. Once the sample is recovered the sample tube is stored in racks with the open cutting edge sealed onto matting in the base of the rack.

Lessons

- Environmentally sensitive
- Safe & efficient deck operations
- Accurate, reliable control system
- Larger casing/sample sizes
- Importance of BH Design
 - Client approval prior to dives
- Maintenance Program

Today

2ROVDrill Mk.2 Systems

Frame Agreements:

Clients:

- 3 Year FA with Statoil, worldwide
- 3 year FA with Shell; UK, Ireland, Holland & Norway

Main Contractors/Subcontractor:

- 3 Year FA with Gardline Geosciences (incl. AsianGeos)
 - Full geotechnical support

Contract Opportunities:

- Middle East, Asia Pacific, Brazil
- Renewable markets, high energy environments



Sunrise in the North Sea

