



2014 OFFSHORE TECHNOLOGY CONFERENCE ASIA

25–28 March 2014 • Kuala Lumpur, Malaysia
Kuala Lumpur Convention Centre

"Meeting the Challenges for Asia's Growth"



Frédéric Jacquemin

7th Generation Rig Panel: Aligning
Operators, Drilling Contractors and Yards

March 26th 2014



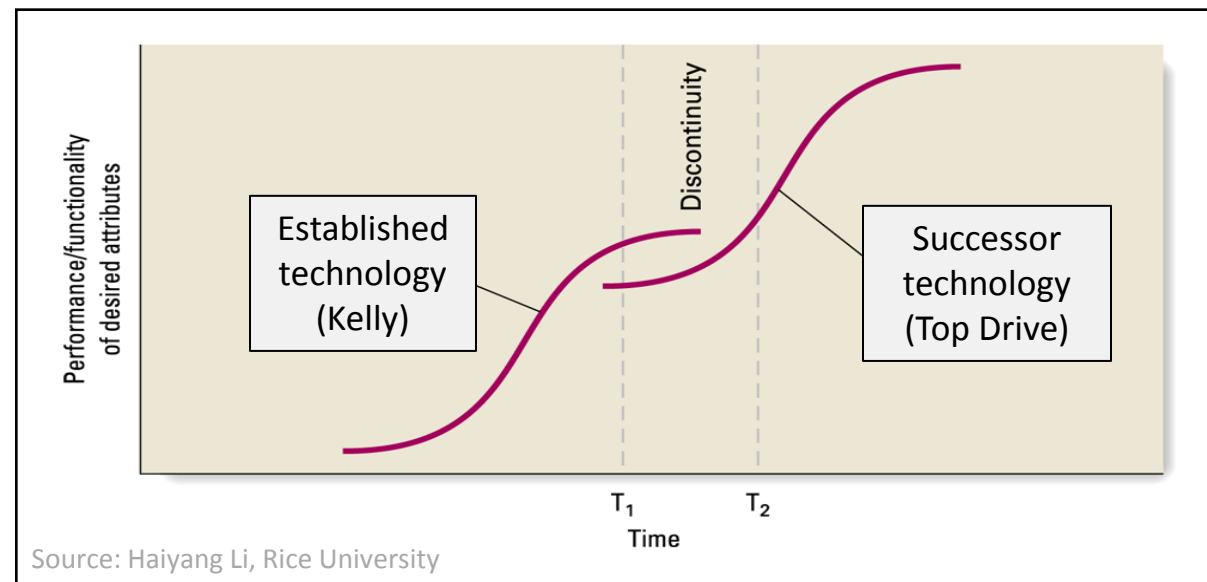
What Defines a Passage to a New Rig Generation?

Notion of disruptive technology

“A new technology that gets its start away from the mainstream of a market and then, as its functionality improves over time, invades the main market” (C. Christensen, 1997).

Such new technology is disruptive, because it:

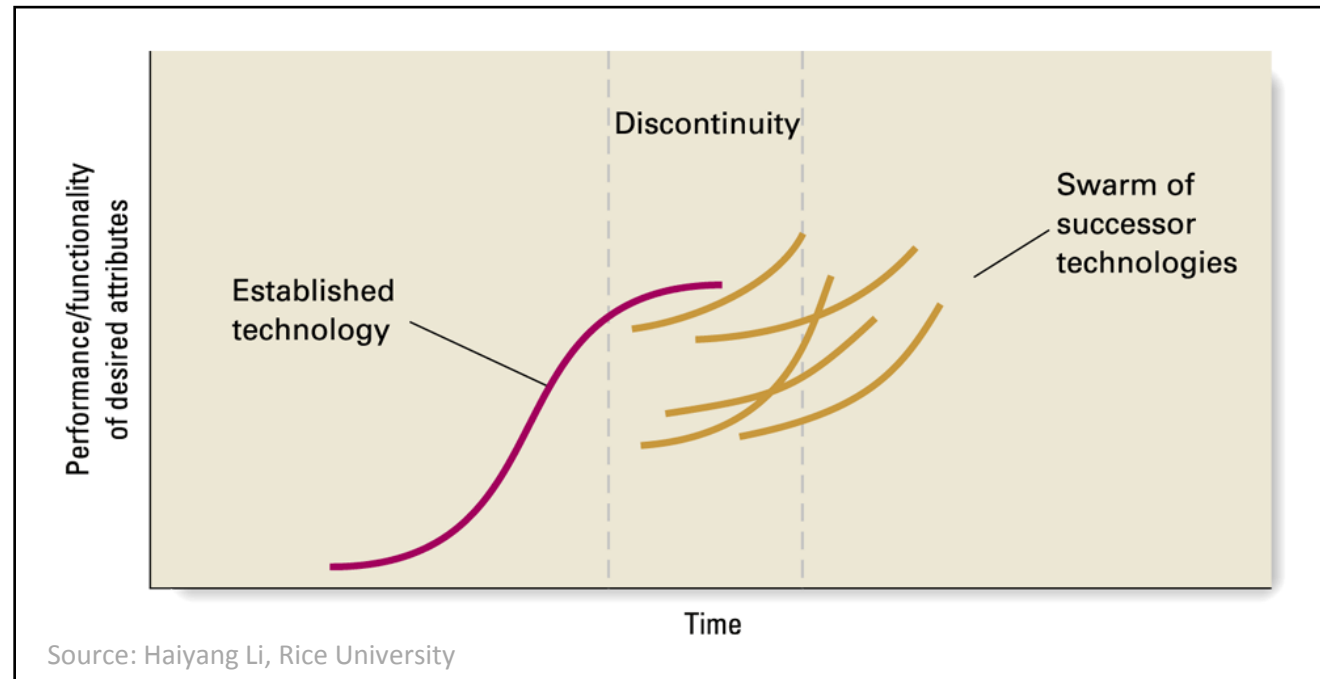
- Revolutionizes industry structure and competition
- Makes established strategies obsolete
- Causes the decline of established companies



Which Technology will Make 6th gen Rigs Obsolete?

Recent generation gaps come from disruptive technologies:

- 4th generation: hull design, resistance to harsh environment (late '80s)
- 5th generation: rig floor automation, dynamic positioning (late '90s)
- 6th generation: dual derrick, offline handling, flat-line reduction (late '00s)
- 7th generation: no globally accepted industry definition yet



Rig Design Features Need to Align with Operator Demand

Desired design features:

Proven design & drilling package

Water depth capability 12,000 ft

1250 ST hook loads; 22,000 MT VDL

Dual derrick & offline handling capabilities

200 POB, with single/double occupancy only
and many client/3rd party office space

Up to 40,000 ft Drilling Depth
with one or two six-rams BOPs

Satisfy operator demand:

Guarantees equipment reliability

Capable to drill in all water basins

Exceeds most demanding well-
construction requirements

Optimizes drilling efficiencies, reduces
flat lines during well construction

Accommodates needs of remote and
complex projects

Meets needs for redundant safety
systems and latest regulations

Those features are pre-requisites for 7th generation label, but not disruptive.

What are Operators Really After?

Desired well construction features:

Improved riser margins

Wider drilling window (Pore/Frac Pressure)

Access to deeper reservoir targets

Fewer casings / better cement jobs

Less downhole problems and NPT

Improved pipe/casing tripping technology

Satisfy operator demand:

Safety and well control guarantees

Pushes exploration boundaries

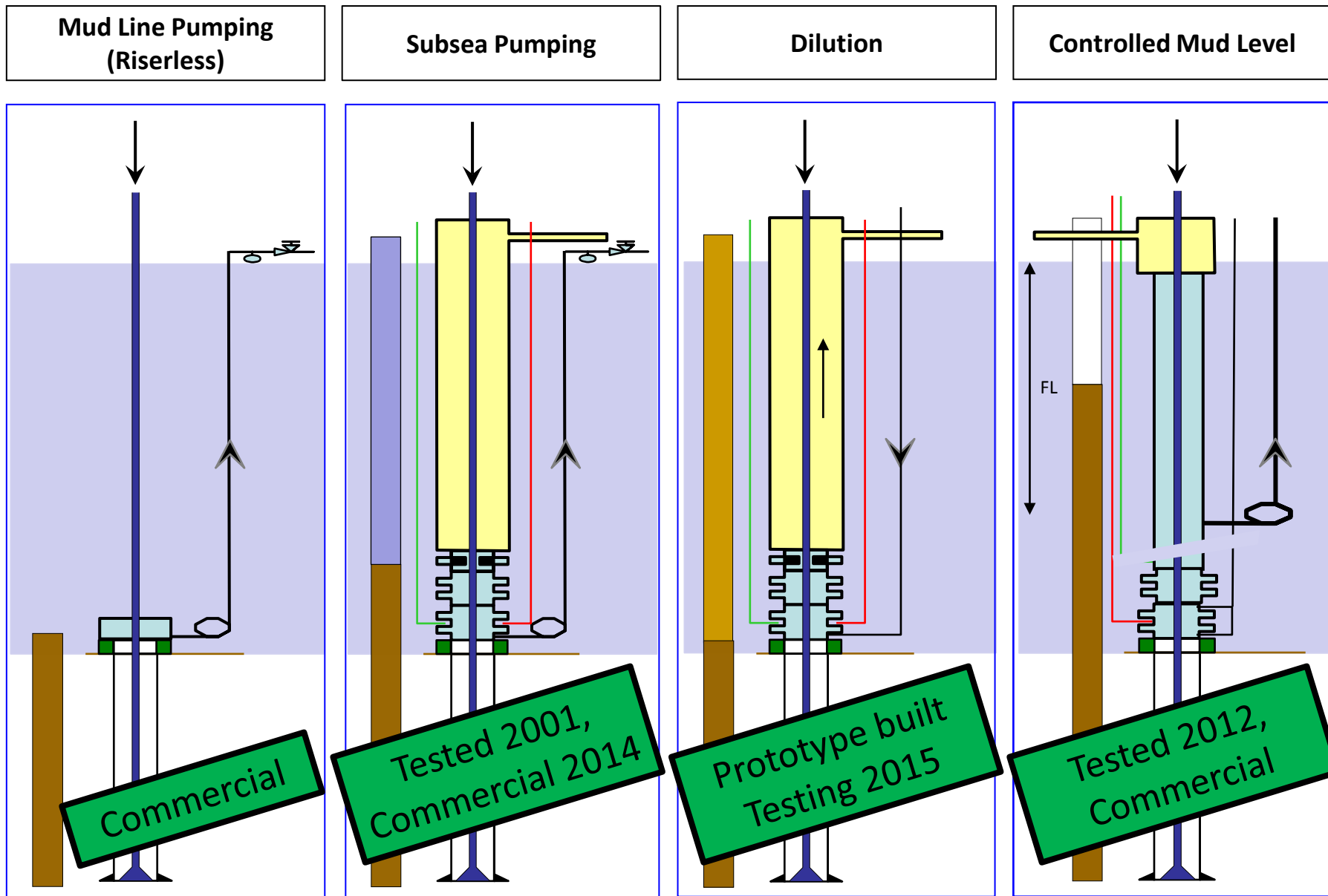
Additional reserves

Overall reduction of time/cost to drill

Easier financial planning

Further reduction of flat times

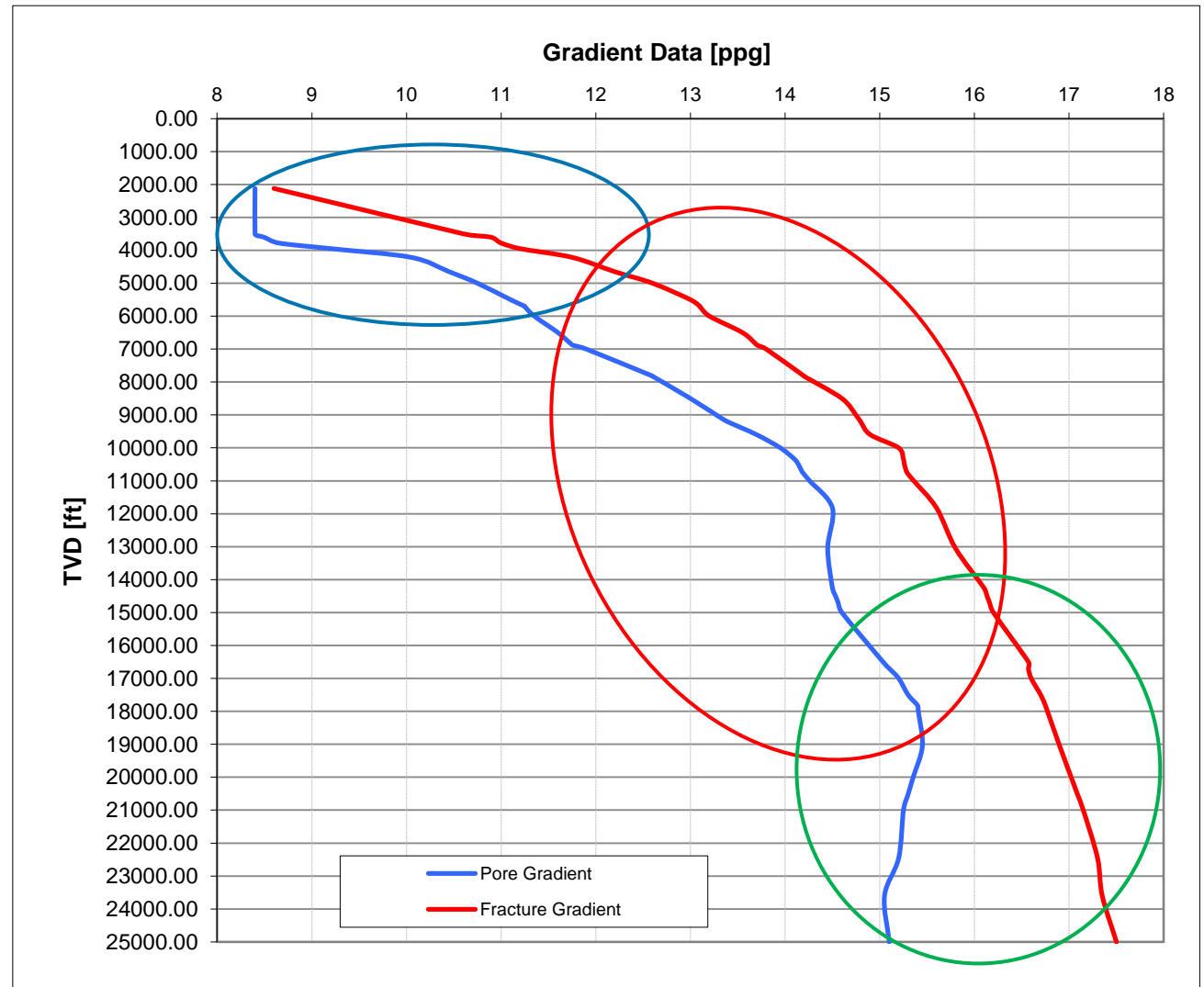
Dual Gradient Drilling Technique - IADC Classification



Dual Gradient Drilling Techniques Are Disruptive

Impact on well design

1. Top sections, use Mud Line Pumping and weighted fluid
2. Mid sections, use fluid with higher density and full Dual Gradient benefits
3. Controlled Mud Level and ECD management conventional density fluid



Source: Statoil – IADC DGD workshop 2013

Final Thoughts for the Panel Discussion

- DGD is certainly disruptive, changing the way we design wells, opening many new avenues.
- Innovation in our industry is not optional, it is a question of survival.
- Success can only be achieved with synergies between shipyard, driller, equipment manufacturer, and operator from day one until execution.
- Integrating new technology is not just about equipment; defining new processes and training people are essential.





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