

Wells Technology

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Global Well Technology Deployment Manager

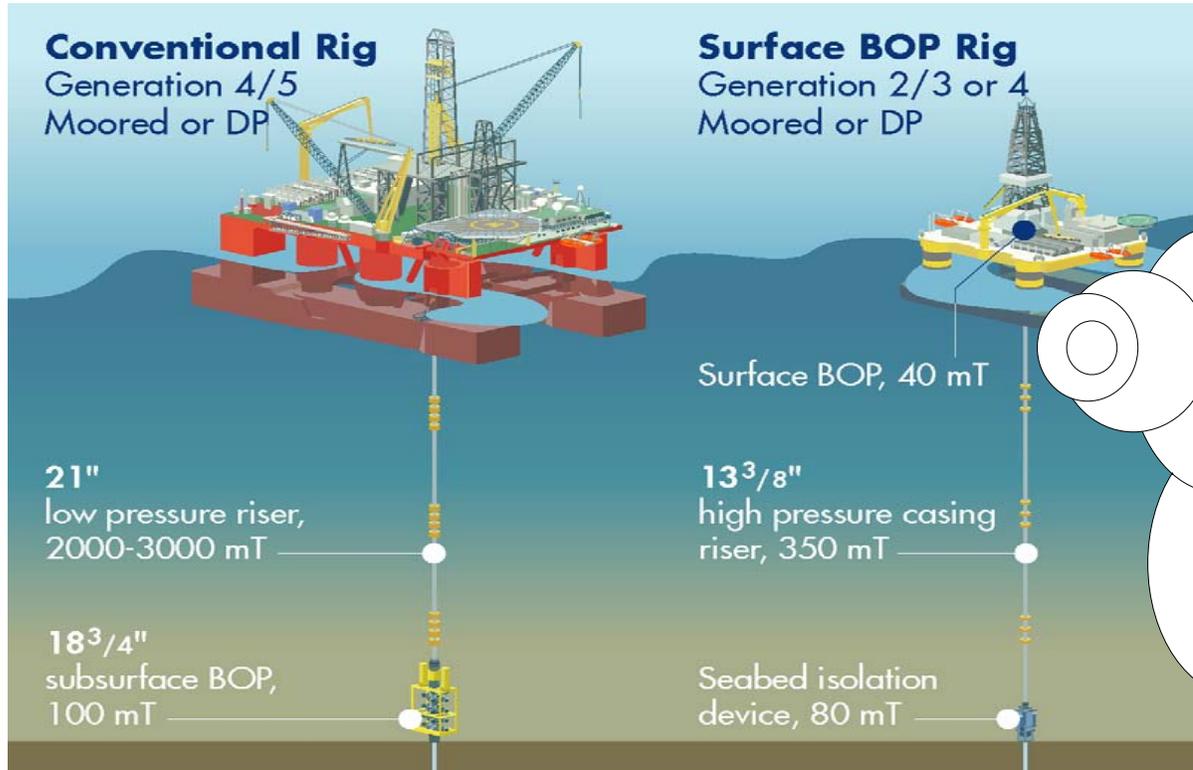
OTC

Houston, TX – May 2009



Surface Blow Out Preventer

Happening Now!

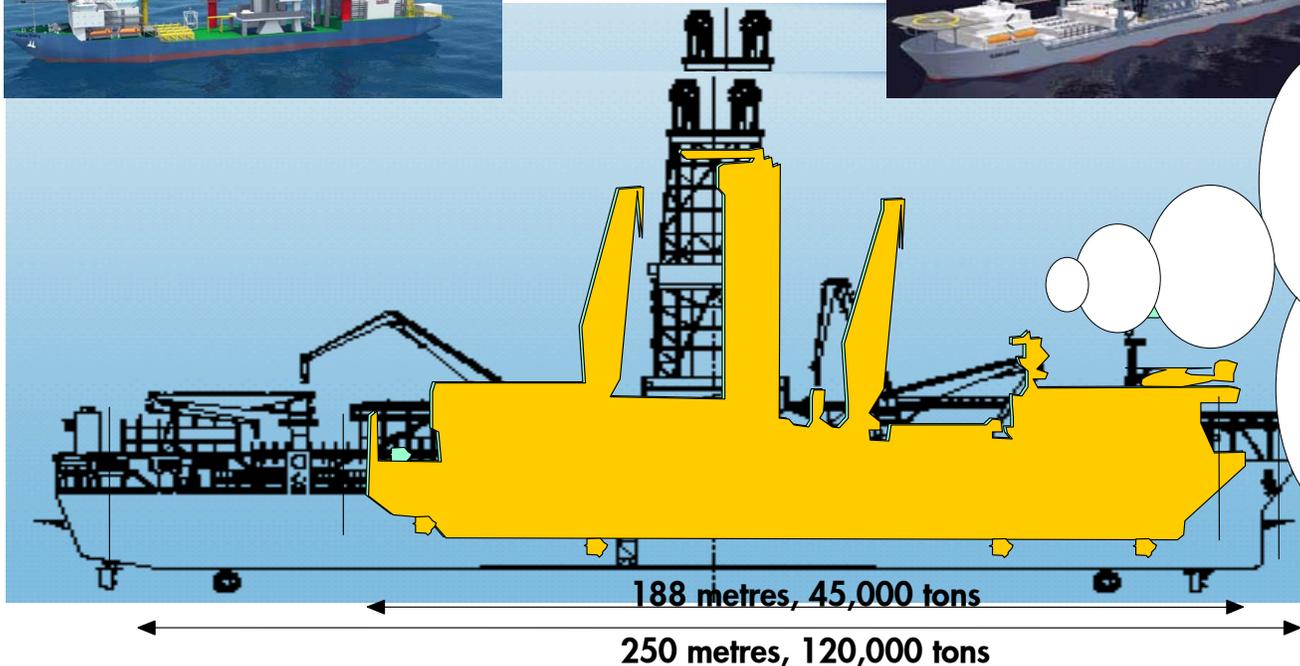


- Using Smaller rigs reduces energy use, emissions and costs
- Used to date in SE Asia, Brazil, Egypt (total of 14 wells)
- Used for near normal pressure & shallow prospects
- Best economics in >6,000 ft water (depending on rig availability/mob)



Frontier's Bully Rig Superimposed on a Gen 5 Drillship

2 currently in the Shipyard (2009-2010)!



- Joint development and ownership
 - Reduces fuel consumption, emissions, and cost
 - Guaranteed availability
- Custom design reduces footprint and overall well cost

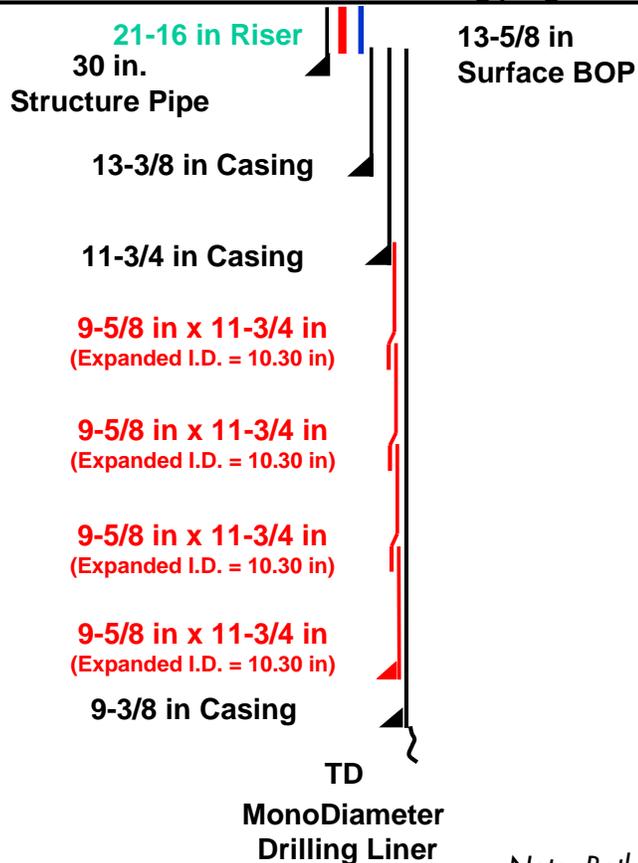


Two Key Technologies under Development with Large Potential Impacts On Rig Footprints

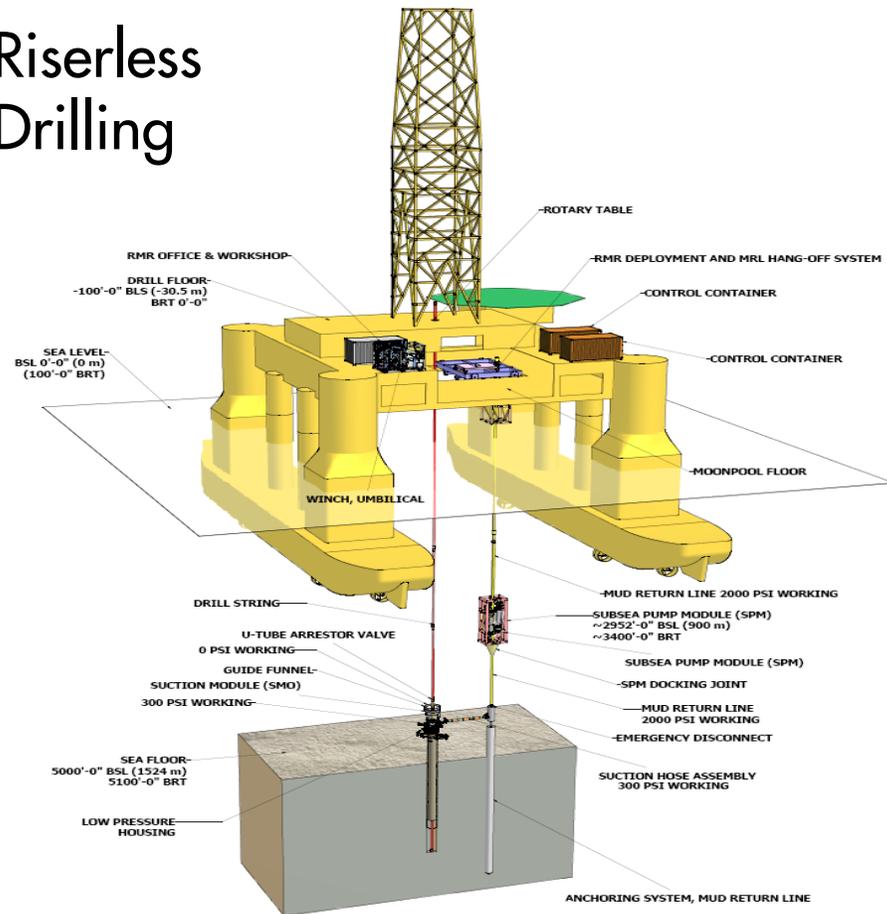
Slimwell & Drilling MonoDiameter Design

Requires

- Standard Design for ALL Bully Rig Wells Drilled
- Have “one size fits all” casing program



Riserless Drilling

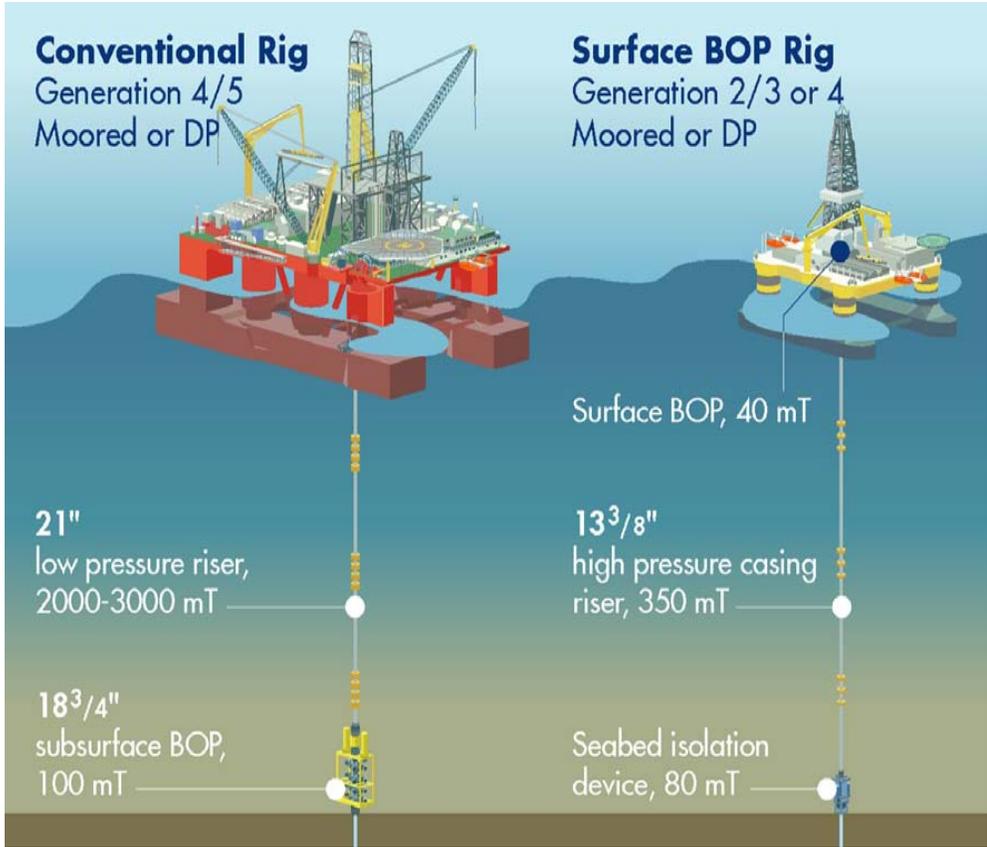


Note: Both technologies in prototype/field trial stage



A Gen 2/3 Rig + SBOP + MonoDiameter = Ability to Drill Almost any Exploration or Development Well

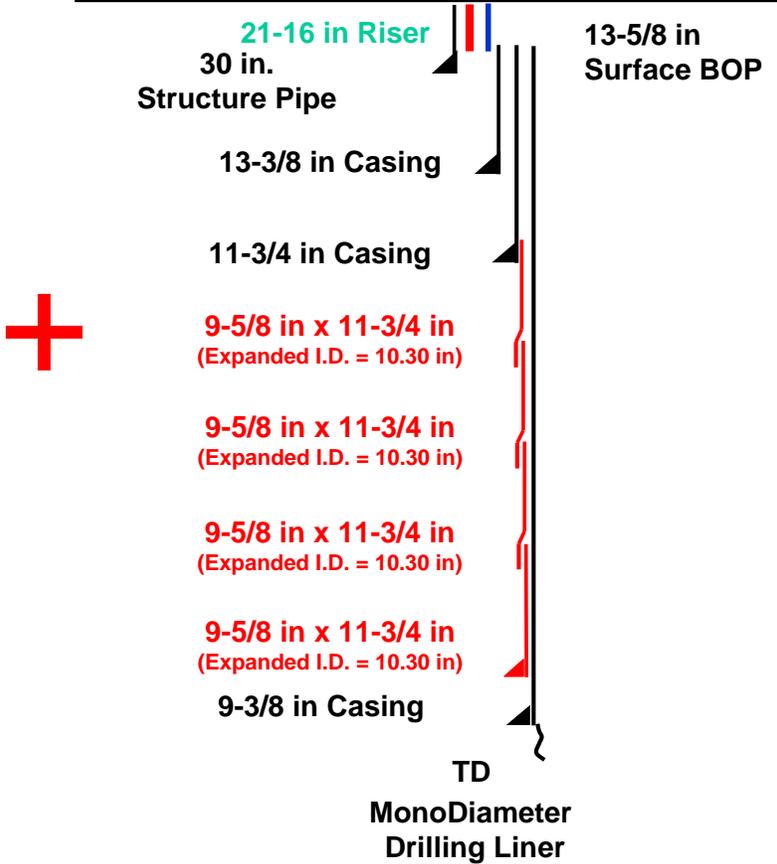
Gen 2/3 rig w/ Surface BOP



Slimwell & Drilling MonoDiameter Design

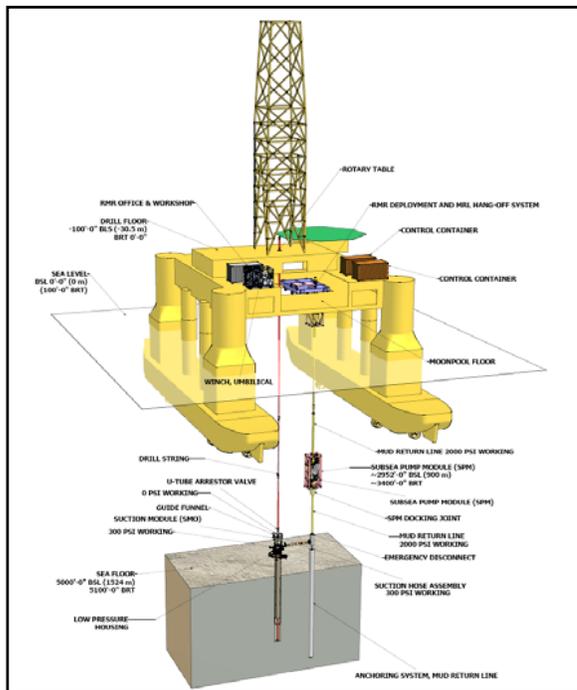
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Combining MonoD and Riserless Drilling Could Reduce Bully 3's Designed Footprint another 25%+

Riserless Drilling



Slim Well Design Using MonoD

30 in.
Structure Pipe

13-3/8 in Casing

11-3/4 in Casing



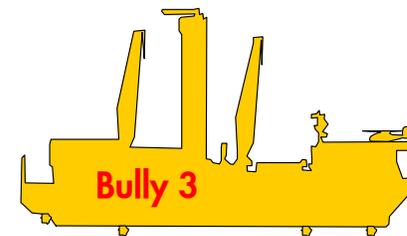
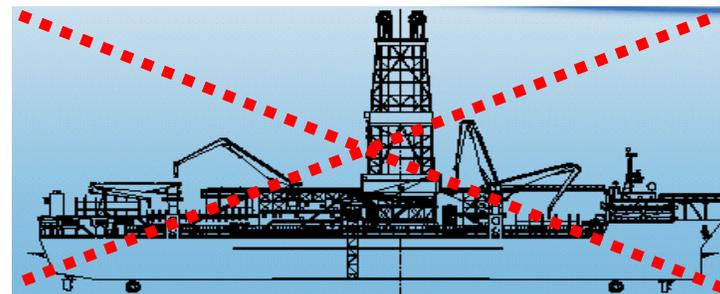
9-5/8 in x 11-3/4 in
(Expanded I.D. = 10.30 in)

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9-3/8 in Casing



No riser and will only handle
13-3/8" casing and smaller

Conceptual: has not been designed



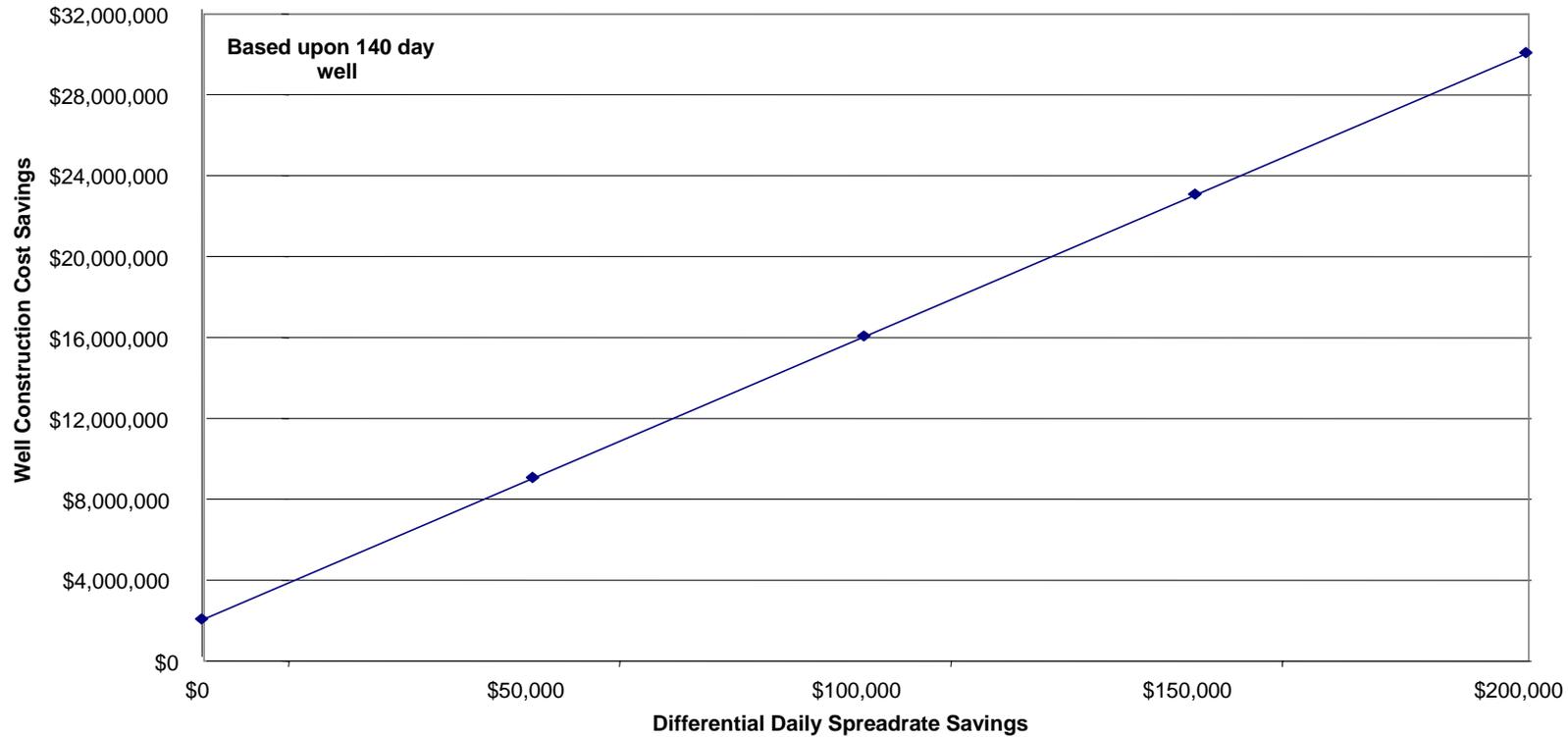
A Summary of the Benefits?

- Improved environmental protection
 - Reduction in consumption of natural resources and associated emissions
 - Reduction in the disposal of cuttings and fluids
 - Drilling Fluid Volume - bbls - 44%
 - Cement Volume - cf - 42%
 - Casing Tonnage - 38%
 - Cuttings Disposal – cf - 59%
- Improved safety performance performance (work with smaller kit)
- Increased production rates (Reach TD with Larger Casing sizes)
- Reduced costs (Capex and Opex) in high cost arenas
- Expanded access to reserves currently unreachable or uneconomic



Potential Cost Savings Benefits

Well Construction Cost Savings vs Differential Spreadrate Savings





Shell Exploration & Production

Presentation at OTC

Shell Technology Leads the Way in
Significantly Reducing Drilling Footprint

(and we're not done!)



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Shell International Exploration and Production

