



Drilling & Completions - Deepwater

Efficiency Gains of a 5th Generation Drillship

[Experience from the Chikyu Drilling Campaign]

Drims # 3560642

Chikyu Overview

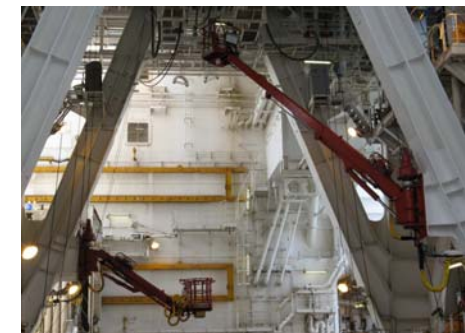
- *Vessel*
 - *Class NK “Scientific Drill Ship”*
 - *210m, 57,000ton (GT)*
 - *Built by MHI, 2005*
 - *2500m WD, 10,000m drill depth*
- *DP*
 - *NK DPS-B, 27,000kW thruster power*
- *Rig floor / derrick*
 - *Dual derrick, well centres*
 - *Hydralift / Hitec equipment*
- *Riser tensioners*
 - *Hydralift N-line*
- *Mud System*
 - *3 x 220HP*
 - *7500psi circulating system*
- *Bulks & fluids*
 - *9,000bbls reserve, 2,500bbls active*



Chikyu Start-up



- The Chikyu had no drilling performance history
- Resourced with dedicated Supt and WSM
- Standard Woodside rig start up process
 - Management system review
 - Hazard Identification & Management
 - Equipment Audit
 - Management review
- Key focus areas
 - DP system
 - BOP system
 - Fluids handling, environmental, helideck
- Rig modifications
 - Moonpool 'lips'
 - BOP guides
 - Cherry pickers
 - Rig floor manipulator arm



Chikyu Start-up

- Successfully drilled Pomboo in 2200m WD
- New rig start-up benchmarks amongst the best for new builds
- Campaign rig equipment NPT at 11% (6% without N-Line Tensioners)
 - A reliable DP system – no NPT throughout the campaign
 - A reliable BOP system – no NPT once commissioned.
- TRCF free for the first 3 months of the contract.

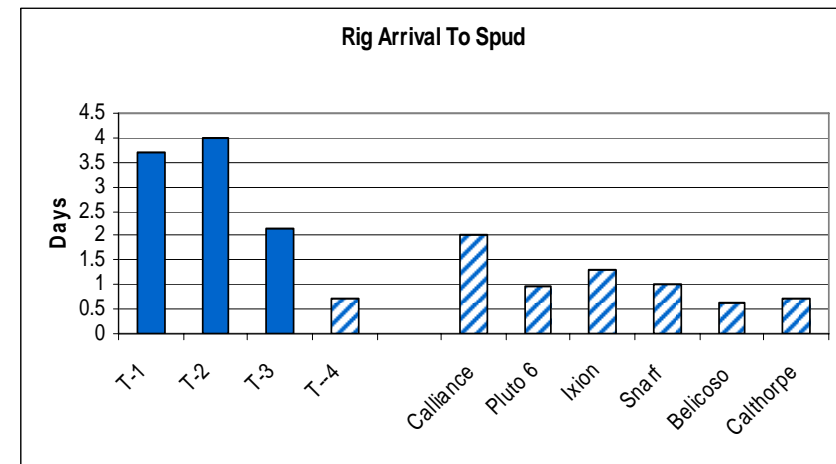
- Major failure of N-Line tensioners during Australian campaign.
 - Rapid wear and deterioration of piston rod coatings
 - Recovery plan initiated for riser-less drilling



Operational Efficiencies

- Moving speed
 - Transit speed of 10 knots
 - No derrick set-back constraints

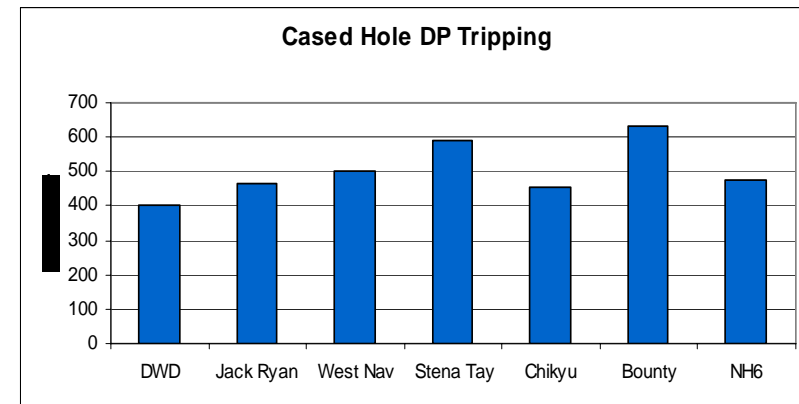
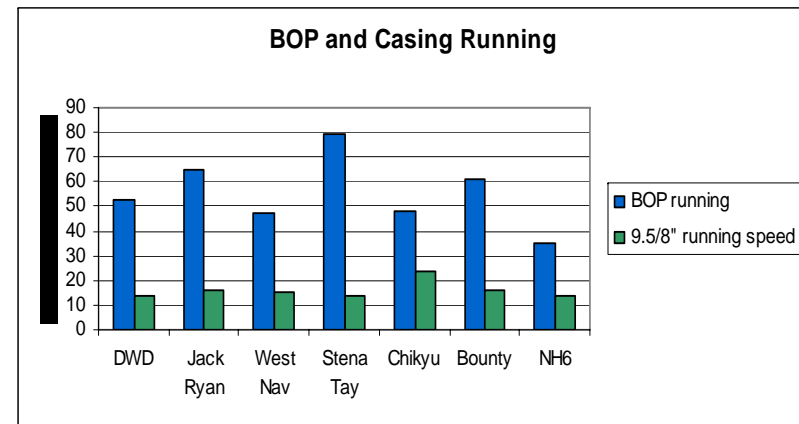
- Dynamic positioning
 - No anchor handling vessels
 - Short time from rig arrival to spud
 - Batch setting opportunities, moving with riser deployed
 - Safe entry and operations over infrastructure
 - Additional flexibility to respond to cyclones



Operational Efficiencies

- Drilling Efficiencies
 - Pipe racked in quads
 - 90ft riser joints
 - Large OD drillpipe
 - 7500psi stand pipe, 2200HP pumps

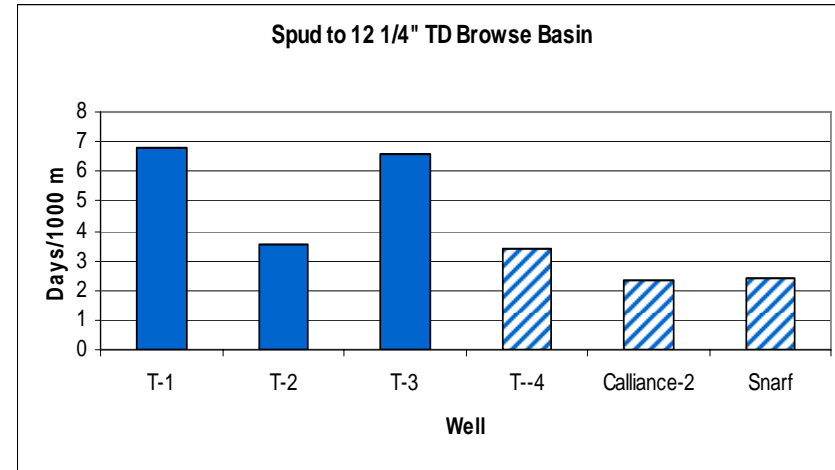
- Dual derrick & offline work
 - Ability to move with the derrick full
 - No on-line pick up / lay down
 - Rack full casing strings offline
 - Prepare & rack multiple BHA's



Operational Efficiencies

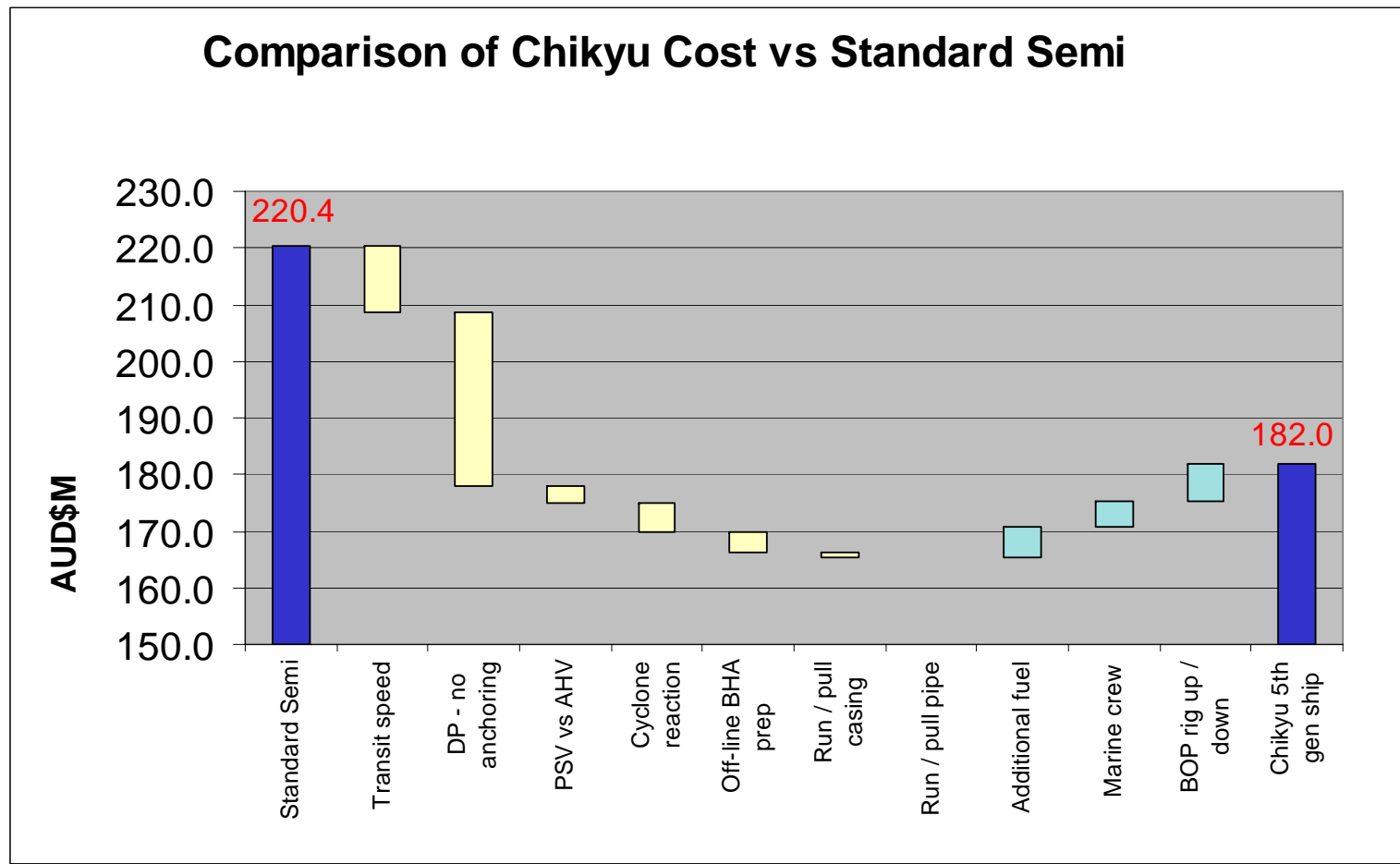
- Drilling fluids handling
 - Large pit capacity (6900 bbls)
 - No requirement for continuous supply
 - Mix spud mud in transit
 - Can accommodate multiple fluid types

- Logistics opportunities
 - No VDL constraints / ample deck space
 - Large bulk capacity
 - Opportunity to stop in transit for load out



Chikyu Campaign Benefits

- Operational benefits of Chikyu versus standard semi-submersible.
- Comparison is for the actual Chikyu Australia drilling program.



HSE Performance



Observations

- High level of rig floor automation
- Reduced exposure through Seadrill's 'red zone' rig floor management
- Cherry pickers replaced man riding operations
- Environmental benefits of a rig designed for total containment



Performance

