Large bore well abandonment
depthwater options with light intervention vessels

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Introduction

Eric Gagen

- 19 years in Coiled Tubing
- Experience in Technical operations around the gulf coast
- Land, Inland, Offshore, Deepwater
- Dowell Schlumberger, CTS, WH, Smith, Schlumberger
Deepwater Abandonment Challenges

Often complex
Records may be poor and gathering data is expensive
Well condition not accurately recorded, or may be deteriorated
Requirements for abandonment are often different now than at the time the well was drilled
Cement across multiple liner annuli required
Tubular goods often need recovery
Wellheads may or may not need recovery
Intervention options

Rig
- time consuming, expensive, certain – full bore riser can be assumed

Light intervention
- Lower cost, faster, must de-risk – riser usually less than full bore

Riserless
- Restricted applicability

Hybrid
- Start riserless or light, finish with rig
Light intervention

Usually successful, but how do we make it efficient?

- Biggest factors – organization, planning, understanding
  - Lack of understanding of abilities and limitations of different services
  - Unclear cut points – when do you pull the plug?
  - Inadequate contingency planning

- Correct vessel selection

- Downhole equipment and tool selection and limitations

An integrated team working together on a regular basis!
Vessel selection: What do we need to have?
Vessel requirements

IRS
Motion compensation
Riser with or without jet line
ROV
Crane, Derrick or Hoist with compensation, or which can hold a compensator for wellwork
Ability to run and pull stick pipe, even if limited
Auxiliary crane which can reach main load point over well
Auxiliary crane which can reach all or most of deck at sea
Downhole technical challenges

Inflatable packers
Cement verification
No ‘one size fits all’ vendors or products
Often inconsistent performance and error correction
vendor reps and engineering support not focused on these types of operations
Perforating must be precise – not over or under powered
Generally good
Eccentric perforating often unsuccessful
Possible applications – abrasive cutting
Systemic challenges

Lack of standard processes
Lack of widespread awareness of processes

Solutions: Integrated management of various processes
Maintain continuity of services and providers from one operation to the next
Focus on overall system efficiency not individual service costs
Example Well done in 2012

- Run riser, latch up pull crown plugs
- Mill the surface cement plug on CT with a 5.43” mill and run in hole to 10,200 ft to verify well is clear

Shallow TA plug in 9 5/8” casing 5.5” ID riser

No Cement across casing shoes
**Downhole solutions**

- Run e-line with casing punch.
- RIH CT with nozzle and pump 41 bbls cement into 9 5/8” x 13 3/8” annulus placed from 10,200 ft to 10,900 ft. Test cement and record.
- RIH CT with CoilFLATE* inflatable packer to bubble test production casing and 9 5/8” x 13 3/8” annulus.
- RIH CT with nozzle to 10,100 ft place 36 bbls cement slurry from 10,100 ft to 9,600 ft in 9 5/8” casing. Test cement and record.
- Run e-line with casing punch & split shot.
- RIH CT with CoilFLATE* to displace fluid in 9 5/8” x 13 3/8” annulus to 14.5ppg WBM.

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*Note: CoilFLATE is a hypothetical tool or method used in the context of well intervention solutions.*
Behind Casing solutions

- Pull riser
- PU drillpipe and pull 9 5/8” casing from shot at 4,000’
- RIH E-line and place drillgun and retainer assy at 3,920’
- Run Riser
- RIH CT with stinger for cement retainer/drill gun. Pressure up to perforate 13 3/8” casing and perform injection test.
- Pump 29 bbls cement slurry to place plug from 4,100 ft to 4,800 ft in 16” x 13 3/8” annulus.
Near Surface solutions

- Pull riser
- RU and run E-line to Split 13 3/8” casing at 3,100’
- Pull 13 3/8” casing from 3,100’
- Run E-line to punch casing and set cement retainer in 13 3/8” casing
- RIH CT with stinger BHA and displace fluid in 13 3/8” x 16” annulus with 14.5ppg WBM. Sting out of retainer and spot 300 ft cement plug on top of retainer.
Light Intervention track record

Operations in the Gulf of Mexico
Q4000 120 interventions 70 P&A’s
Uncle John 16 interventions, 16 P&A’s
Fugro Synergy 3 interventions 3 P&A’s
Q5000 1 intervention

140 interventions and 102 P&A’s starting in 2003
Remaining challenges

High reliability inflatable packers to cover wider job scopes
Logging tools to tell difference between cement and drilling mud behind pipe
Verification of annular seal without pressure testing
Standards for expecting a seal from settled barite
Abrasive cutting of tubular goods where perforating gun performance is insufficient or difficult to calibrate and verify
Questions?