Inflatable Technology

Sometimes It Is The Only Solution - 2018
Presentation Content

- Understand when and where inflatable technology can be applied for cost effective Well Intervention.
- Explore how inflatable solutions can add value and improve efficiency during P&A/Intervention operations.
- Demonstrate through specific case histories how versatile field proven solutions can be applied in the current economic climate.
Inflatable – When and Where?

- Extreme Expansion Ratio.
- Point loading.
- Through restrictions.
- Across perforations.
- Corroded, scaled and collapsed tubulars.
- Application may be shallow (no string weight available).
- Open hole applications.
- Large ID casing to eliminate damage to tubulars caused by mechanical slips.
- Contingency planning.
Inflatable Applications

• P&A/Pre-Abandonment.
• “Creeping Shale” barrier verification.
• Temporary suspension.
• Chemical placement.
• Selective stimulation/testing.
• Well Integrity.
• Water shut off.
• Workover/wellhead repair.
• Barrier verification.
• Reservoir evaluation (LOT/MINI-FRAC).
• Zone isolation.
Selected Well Intervention Case Histories

- Cemented Tie-Back for workover campaign.
- Coiled Tubing P&A Solutions.
- Swellable Packer for open hole leak off testing in Geothermal Well.
- Bridge Plugs in Section Milled Casing Windows for P&A campaign.
- Resettable Straddle Packer to perform open hole mini-frac.
- Leak Detection/Pressure Testing in large casing.
Case History 1 – Cemented Tie Back

The value and life of an ageing well can be maximized by working over with a cemented tieback casing string. Reasons to install a tieback casing string can include, but are not limited to:

• Loss of well integrity due to ageing/corroded production casing.
• Requirement to retrofit a gas lift system with premium gas tight connections in the production casing.
• 35 x 7” Metal to Metal Seal Port Collars successfully run to cement tieback casing inside 9-5/8” Production Casing since November 2012 for a major North Sea operator.
• Two jobs required two runs with running tools due to seal cup wear/damage.
• Bumper subs introduced into running tool BHA due to difficulty opening Port Collar at higher deviations.
Case History 2 – Coiled Tubing P&A

• Successfully ran 3.75” Inflatable Cement Retainer through 4.95” restriction and set in 7” liner to place 1000ft cement plug in A annulus for P&A.

• Successfully ran a 2.90” Inflatable Multi-Set Packer through 3.813” restriction to set inside 5-1/2” tubing to test cement plug. Unable to test plug via tubing due to poor condition of completion tubing.

• Successfully ran 4 x 3.50” Inflatable Bridge Plugs through 4.06” restriction and set inside 9-5/8” casing to abandon the reservoir.

• Successfully ran 2.50” Inflatable Multi-Set Packer to verify communication between perforations made in tubing for pre-abandonment of reservoir prior to full abandonment with rig.
Case History 3 – Retrievable Swellable Packer

- Open hole leak off test was required to determine initial frac pressure in geothermal well. BHT was predicted at 200°C which precluded the use of conventional Inflatable Open Hole Packers. A 6-5/8” geothermal high temperature swellable packer was run on drill pipe to perform the leak off test and successfully retrieved.
- During operations BHT was measured at 330-350°C!
- TAM’s high temperature geothermal elastomer was the only possible solution.
Case History 4 – Section Milling P&A

- Successfully run 8 x 7.38” Inflatable Bridge Plugs through 9-5/8” casing and set in 13-3/8” casing window as base for P&A cement plug in 4 wells.
- Closed system ran with clean inflation fluid and foam wiper for fluid separation to prevent plugging of inflation ports due to residual swarf and debris left in hole from section milling.
Case History 5 – Open Hole Mini-Frac

• Successfully ran 7” x 11” Inflatable Multi-Set Straddle Packer with memory gauges to perform Open Hole Mini-Frac in 12-1/4” Open Hole.

• Due to well deviation in the overburden it was not possible to perform this operation with standard wireline straddle and get enough data for evaluation purposes.

• Full function test was performed in TAM workshop prior to mobilisation offshore to ensure customer operations and subsurface teams were comfortable with solution proposed and tool operation.
Case History 6 – Leak Detection/Pressure Testing in Large Diameter Casing

- Ongoing P&A programme where 14-1/2” Inflatable Multi-Set Packer is mobilised as contingency to test final abandonment plug inside 20” casing. Currently on 3rd well of 12 well campaign.
- Due to condition of surface casing and concerns over casing connections, packer may be required to set immediately above cement plug placed in 20” casing to verify barrier.
- Inflatable packer can run through 17.56” wellhead restriction and set in 18.75” ID casing.
- Additional benefits are no weight required to set packer at shallow setting depths and no potential for casing damage caused by slips used in conventional mechanical packers.
Summary

• Inflatable technology can provide flexible solutions that contribute real value to well intervention operations.

• When all conventional solutions have been exhausted inflatable technology can provide a field proven and cost effective alternative to a major workover.

• Detailed well information, planning and preparation are critical to the successful deployment of inflatable technology.
Thank You

Questions?