

HIGH EFFICIENCY P&A PREPARATION ON E-LINE INNOVATIVE ROBOTIC TECHNOLOGY

PRESENTED BY CHRISTIAN KRUGER, VP ACCOUNT MANAGER
DATE 17 SEPTEMBER 2019

Agenda

01.

Powered Mechanical Interventions overview

02.

Key technologies for P&A

03.

Operational efficiency savings through advanced service combinations

04.

Additional service applications during the P&A phase

- › Fluid injection on wireline
- › Powered mechanical services on slickline

05.

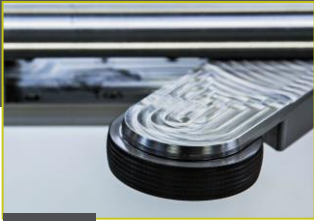
Q&A session



Interventions Services Overview



Welltec® Solutions Portfolio



Conveyance solutions

Well Tractor®



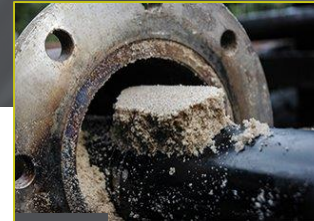
Mechanical solutions

Well Stroker®,
Welltec Release
Device®, Well Key®,
Well Cutter®,
Welltec® Puncher



Milling solutions

Well Miller® -
Hardware Milling,
Expandable Bit



Clean-out solutions

The Well Cleaner® -
Power Suction Tool,
Reverse Circulating
Bit, Rotating Heads;
Well Miller® for Scale
Removal



Fishing solutions

Robotic Fishing
BHA's

Launch of Dedicated E-line Fishing Solutions Department



Solution-driven company



Performing fishing operations utilizing existing solutions



Dedicated e-line fishing solutions department



Robotic e-line fishing tool packages



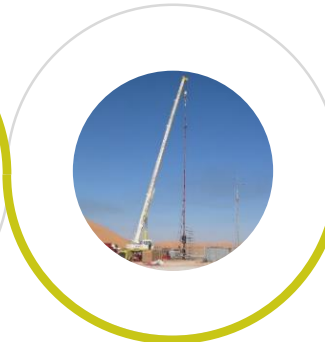
Replacing heavy, conventional fishing methods



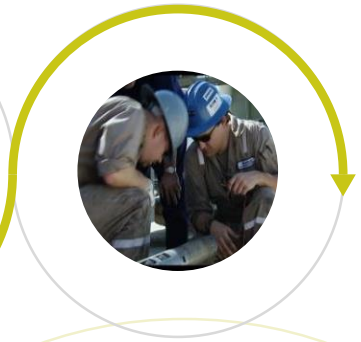
Restoring production and well bore access



From drilling and snubbing fishing interventions ...



... to coiled tubing and braided / slickline line fishing interventions ...



... to intelligent robotic e-line fishing interventions



Key Technologies for P&A

Welltec

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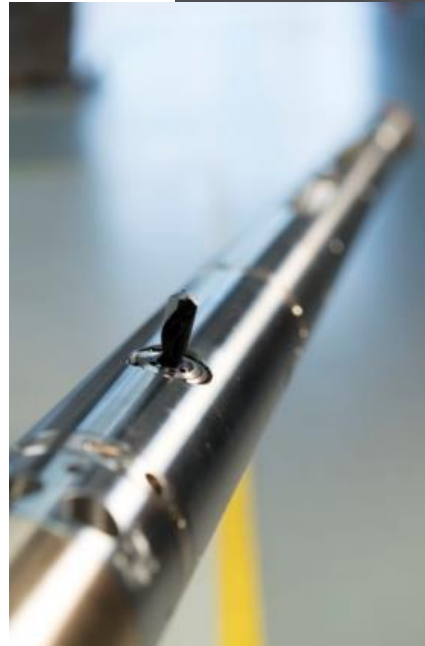
Welltec® Puncher

Applications



Specifications* 318

Length	15.4 ft
Running OD nominal	3 1/8"
Weight in air	355bs
Minimum completion ID	3.2"
Maximum pipe thickness	1"
Maximum pipe ID Hole Diameter	7" 0.20" - 0.47" (1.0")
Maximum well pressure	25,000 psi
Maximum well temperature	302° F
Tensile strength	42,000 lbs
Compressive strength SRO 1.0 Readouts*	50,000 lbs Punching depth



Pressure release

- › Any hole size
- › Fast
- › One hole
- › No damage to outer casing



Heavy fluid flow path

- › Big hole
- › Orientation in highly deviated wells
- › Few holes

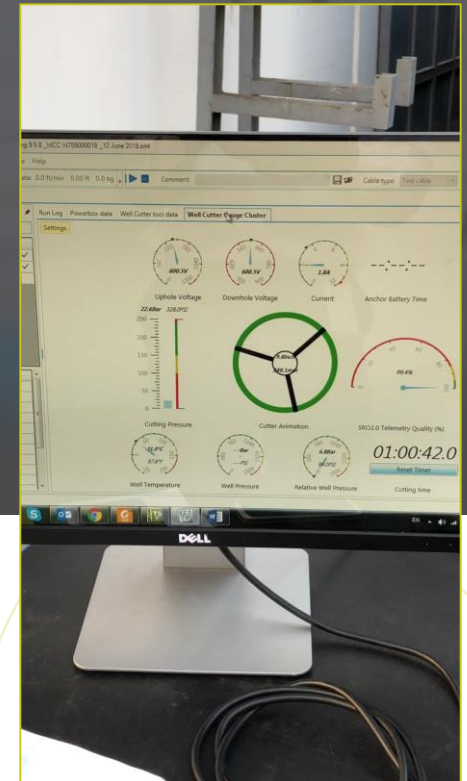


Production/ Injection control

- › Specific size holes
- › Orientation
- › Multiple holes

Well Cutter®

Cut in compression – no rig required



Operational Efficiencies for P&A

Welltec

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Welltec

Rig: OSC
Well: C-6
Run: 218W-358 WCC
• Breaking points

	MAX OD	3,622 in	Run length (ft)	Acc. length (ft)	Weight (lb)
Welltec Cable Head, fishing neck 1/2" x 1/2"	1,075 in	5,718	17,89	318	Welltec
Welltec 218 WCC 1.6 Welltec Tubular Cutter ESD 13004 jumper placed 218 1/2" Tubular Taper cutting 1/2"	3,738 in	1,13	17,87	281	Welltec
Welltec 218 WCC 1.6 218 1/2" Tap	3,738 in	5,46	18,81	331	Welltec
Welltec 218 WCC 1.6 ESD 13004 Bumper Head Cut	3,738 in	5,47	18,78	121	Welltec
Welltec 218 WCC 1.6 ESD 13004 Bumper Head Cut	3,738 in	5,47	18,78	121	Welltec
Welltec 218 3 R Spacer with Special Device 218 Tubular Head Cut	3,738 in	1,13	18,89	381	Welltec
Welltec 218 WCC Welltec Tubular Cutter ESD 13004 218 1/2" Tap 218 angle any direction	3,738 in	5,46	18,80	221	Welltec
Welltec 218 WCC ESD 13004 jumper placed 218 Tubular	3,738 in	5,46	18,77	381	Welltec
Welltec 218 3 R Spacer with Special Device 218 1/2" Tap	3,738 in	5,46	18,81	381	Welltec
Welltec 218 WCC 1.6 Welltec Tubular Cutter ESD 13004 218 1/2" Tap 218 angle any direction	3,738 in	1,13	18,89	381	Welltec
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Distance between anchors 1/2" in
Distance cutting point to lower anchor 1/2" in



One run Combination of Well Cutter and Welltec Puncher Background



Planning

Prepare the well for P&A by set plug @3691, and cut 5" tubing above plug.



Result

- Welltec and Client agreed to run the WCC 358 in combination with the new WP 318, in order to save 1 run + rig time.
- WCC 358 –WP 318 run: Effective cut time: 16 min. Achieved circulation rate of 420 l/min through the cut. Decided to punch 3 holes above the cut. The correlation and punch sequence was done in 1 hour. A circulation rate of 750-1000 l/min was achieved after successful punch operation

Non-Explosives Services Save One Run



Welltec 318 WP was combined
with 318 Well Cutter



Not enough circulation after cut



Punched 3 holes in same run



Saved one extra run of 14
hours


OSC-05

Value created due to ability
to combine solutions



Intervention Triple Combo

(1 run vs 3 runs)

Total		Max OD 3,874 in	Item Length
	Welltec WP 318 Basic Bottom connector for Puncher ES44228	3,149 in	575,06 cm
	Welltec Well Cutter 358 (4,5-5,5) Mono top F1RP (GO) ES44146	3,622 in	533,53 cm
	Welltec WST 378 EH Top con. F8RP tandem top ES44158	3,874 in	426,15 cm

Example of job sequence

- 01.** Set plug below production packer using, swivel, wireless bridge and hydrostatic plug setting tool
- 02.** Pressure test
- 03.** Cut tubing
- 04.** Punch tubing to gain circulation



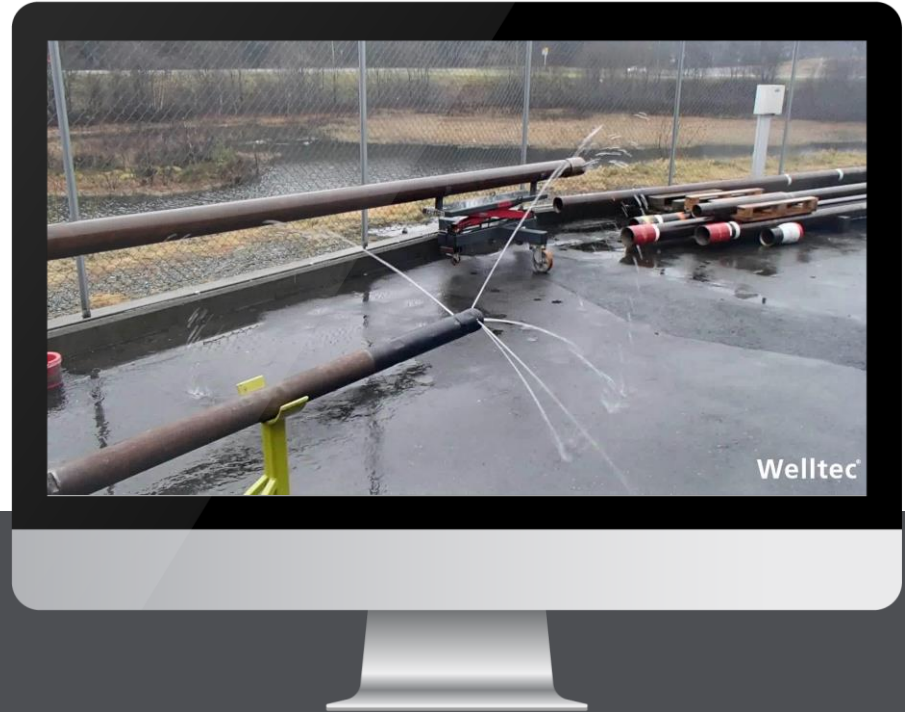
Additional Services

Welltec®

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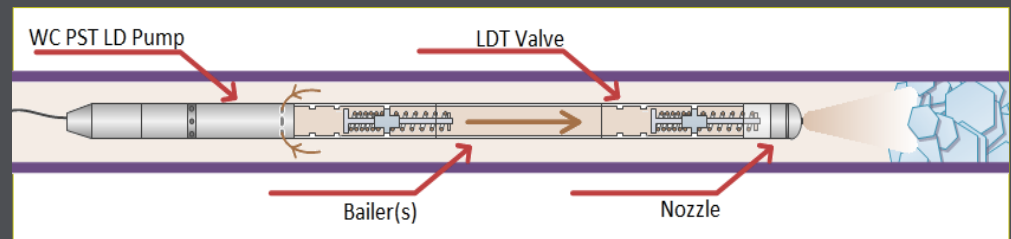
Deliver Fluid Downhole on Wireline

Well Cleaner Downhole Jetting Tool



Well Cleaner Downhole Jetting tool (DJT)

- › Efficient downhole fluid jetting
- › Innovative design – powerful flow rates
- › Transports fluids downhole
- › Modular design and configurable nozzles
- › Large capacity
- › Safe and controlled



Slickline Well Tractor



Power is supplied by batteries



The electronics are pre-programmed; when to power down based on timing and pressure switch.



Voltage from the battery will be sent to the electronics, it will then execute the commands.



Bottom
connector

Stand off
Compensator

Wheel Section



Summary

- › Optimization of 'time on well' whilst maintaining conformance to regulations
 - › Ability to perform required P&A activities
 - › independent of existing operational constraints and well factors
 - › Operational efficiency savings through advanced service combinations
 - › Additional service applications during the P&A phase
-

Questions?

