



Customer Success Story

AN EXAMPLE OF HOW GE HELPS CUSTOMERS IN THE OIL & GAS INDUSTRY

GE's DECT cuts 25Cr packer mandrel, in compression, in less than two minutes.

Background

Our customer faced the daunting task of removing a 5.5-inch outer diameter packer mandrel from its well by cutting through the tough 25 percent chromium super duplex stainless steel (25Cr) release sleeve in an unknown amount of compression.

A small cut zone (40 cm) required an easily configurable No-Go system, and the high rig day rate mandated a fast solution.

Solution

GE's downhole electric cutting tool (DECT) was selected for these operations due to its:

- Fast cutting speed (less than two minutes), which significantly reduces rig time
- Versatility to cut pipe quickly in both tension and compression stress states
- Proficiency at cutting high alloy steels, including 718 Inconel and 25Cr stainless steel
- Real-time data reporting ability confirming cut success (cutter position, downhole microphone response, and motor load)
- Excellent adaptability provided by a fully adjustable No-Go that can be placed anywhere in the toolstring
- Flexibility to cut in a variety of well deviations and fluids (gas, drilling mud, and brine)
- Ability to be deployed on mono/multi-conductor cables, all standard tractor platforms, and coiled tubing
- Low power requirements (110/240V AC) reduce the risk of cable/surface equipment related failures

Result

The 25Cr, 5.5-inch outer diameter (OD) packer mandrel release sleeve was successfully cut – in less than two minutes – allowing the packer to be pulled from the well without issue.

The tool's ability to cut in tension and compression states eliminated the need for additional setup and preparation efforts, significantly reducing rig time. The tool also allowed operation to proceed with the pipe in an unknown amount of compression.

By using GE's DECT, the customer received real-time cut progress feedback to help ensure that no damage was done to the outer completion components, while also saving several hours of rig time compared to alternative cutter technologies.



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Job Details

Cutting tool used: GE DECT001, OD: 3.25"

Operational Details			
Material:	25% Cr	Tubing State:	Compression (value unknown)
Pipe OD:	5.5"		
Pipe ID:	4.75"	Minimum Restriction Above the Cut Point:	4.75"
Well Fluid:	Brine (1.25 SG)		
BHT:	102°C	Dev:	41°

Cutting in Compression

GE's DECT has a proven track record of successfully cutting an extreme range of tubulars (OD from 3.5 to 7 inches) in a compression stress state.

Process Overview

During the initial stages of a cut, a section of tubing in compression behaves the same way as one in tension. As operation progresses, the DECT's cutting action reduces the tubing wall thickness, resulting in a smaller cross sectional area of the tubing at the cut point and a progressively thinner section of pipe supporting the compressional load.

Eventually, the compressional load distributed over the reduced area will exceed the yield point of the metal, causing the remaining material to fail through plastic deformation. Then the DECT engineer retracts the cutting blade or, if it has become pinched by the tubing, the blade is snapped off at its specially designed weak point. Next, the tool is returned to the surface, and the pipe is recovered.

The DECT's surface feedback confirms when the tubing failure occurs, eliminating the need to spend additional hours on the cutting operation.

GE's DECT systems have completed 24 cutting operations on tubing/packer mandrels in compression, with a 100 percent success rate.

For more information email:
mechanical.interventions@ge.com

GE Oil & Gas
Building X107
Range Road
Cody Technology Park
Farnborough
GU14 0FG

Visit us online at:
www.geoilandgas.com/wireline