Harpoon Cut and Pull Spear

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Agenda

- Why do we need it?
- What is a Harpoon™ Cut and Pull Spear?
- Product Features
- Case History
- Video
- Summary
Cut & Pull Casing

- Cement Evaluation ► Top of Cement
- Cut xx ft. above Top of Cement
- Engage Casing Spear ► POOH
- What if the Casing is Stuck!!
Another Cut & Pull Attempt

Casing STUCK !!

- Release Casing Spear ➤ POOH
- Need to space out cutting BHA ➤ RIH
- Make 2nd Cut higher up
- Engage Casing Spear ➤ POOH
- One-Trip Solution?
Harpoon™ Cut & Pull Spear

- Drag Blocks
- Flow Port can be closed by setting down while cutting to maintain Well Control
- Slotted Liner Filter Ensures Debris Does Not Get Above Elements Or Slips
- Left-Hand "J"
- Slips
- Packing Elements 7K – 10K psi
Harpoon™ Cut & Pull Spear

- Resettable In-Line Spear for Multiple Cut & Pull Operations in the same trip

- Run above a conventional casing cutter.

- If casing does not pull at lowest first cut then can be repeated higher up the casing until free
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- Facilitates Cuts in Tension to optimise cutting efficiency.
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- Provides means for isolation and well control during cutting operations

*Packing element rated at 5,000psi pressure from below*
Harpoon™ Cut & Pull Spear

- Packing Element feature makes circulating & hydraulic lift assistance possible
- Assists in breaking down solids behind the casing
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- Versatile - can be used with or without PDM motors
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- Filters cuttings and leaves them on bottom
- Prevents debris from collecting in B.O.P stack
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- Robust design enables jarring
- Holds force in both directions enabling jars to be re-set
Harpoon™ Cut & Pull Spear

- Currently available to suit wide range of 9-5/8” & 9-7/8” casing weights

- 13-3/8” Tool in development – estimated Q1 2015

- Run with the Baker Hughes Multi String or Hercules cutter with Knife retraction kit

- AMT Cutter knives enable Multiple cuts without changing knives
Hercules MS Cutter

- Solid body design can withstand extreme shock loads during cutting
- Knife stop indicator can be adjusted without taking tool apart
- Positive adjustment screw can be set for mechanical lock on knives allowing for single string cuts with minimal contact to the outer string
- Knives are 30% stronger
- Knives can easily be changed on rig floor
- Pressure indicator can be set for surface pressure drop at any point in the knife swing
- 8-1/4” OD Tool cut 9-5/8” – 48” Casing OD
AMT CUTTER KNIVES

SPECIAL DRESSED AMT CUTTER KNIVES.

ALLOWS MULTIPLE CUTS WITHOUT P.O.O.H.
Case History: Harpoon Cut & Pull Spear

Objective:
- North Sea – Norway – Slot Recovery
- Cut 9-5/8 in. 53.5 lbs./ft. Q-125 Casing 165 ft. below 20 in. Shoe

Solution:
- Set spear at cutting depth, knives @ 4,011 ft. 28° inclination
- Apply overpull, rotate @ 100 RPM, cut made in 3 minutes
- Barite settlement encountered, release Harpoon Cut and Pull spear, reposition to top of casing stub @ 2,877 ft.
- Applied 312 klbs overpull (fish weight 60 klbs), Retrieved 1134 ft. of 9-5/8 in. casing

Results:
- No stop ring made it possible to the spear to be set immediately above cut point and apply overpull during cutting – cut in 3 min.
- Harpoon Cut and Pull Spear provided a one-trip solution
Harpoon™ Cut & Pull Spear
Summary

- Continuously resettable spear enables multiple cut-and-pull and jarring operations in the same trip
- Helps control gas circulation if a gas kick occurs
- Allows pack-off and hydraulic lift assistance if needed
- Prevents debris from collecting in the blowout preventer stack
- 360° slip coverage maximizes pull capabilities and limits deformation