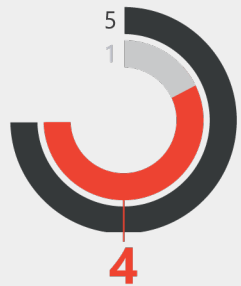


# NEXT GENERATION TRIDENT<sup>®</sup> SYSTEM WITH MAG VALVE

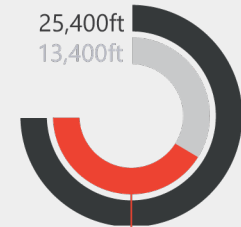
Access high overpull cutting up to 1 million lbs



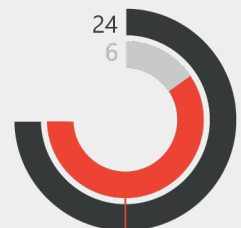
Industry Standard  
Ardyne Operation  
Customer Savings



TRIPS SAVED



TRIPPING FT SAVED



RED ZONE EXPOSURES AVOIDED  
(per person)

## TRIDENT SYSTEM

The TRIDENT System is a single-trip cut and pull rotational spear which incorporates several innovative trip-saving features, including an integral tension set packer, a hydraulically activated spear and a cutting mode which eliminates the accumulation of swarf at surface. In a single trip, the TRIDENT System can run and set a bridge plug or dress a cement plug; positive/negative pressure testing; cut casing; circulate annular gas; and recover casing to surface.

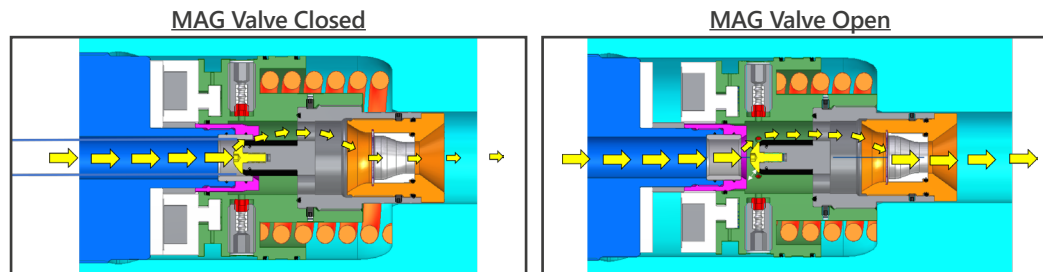
Functionality used on this case study:

- Dressed cement with anchor dormant
- Anchor in 9 5/8" for cutting (no marine swivel required)
- Pulled from 10 3/4" (no short trip of spear required, no slip or grapple change required)
- All in single trip

## THE MAG VALVE

TRIDENT System with the MAG Valve - what do you get...

- Ability to hydraulically set the anchor on demand - motor and cutter dormant
- Full flow once valve open during cutting process or dressing cement
- Allows high overpull cuts up to 1m lbs in tension (without packer)
- MAG Valve does not interfere with any TRIDENT functionality



Operation carried out from  
semi submersible rig

### MAG Valve Closed

MAG Valve closed  
anchor activated  
with pressure

Reduced flow  
to cutter, knives  
dormant

### MAG Valve Open

Increase flow to  
open MAG Valve  
- anchor remains  
active

Motor and cutter  
fully operational

# NEXT GENERATION TRIDENT<sup>®</sup> SYSTEM WITH MAG VALVE

Access high overpull cutting up to 1 million lbs



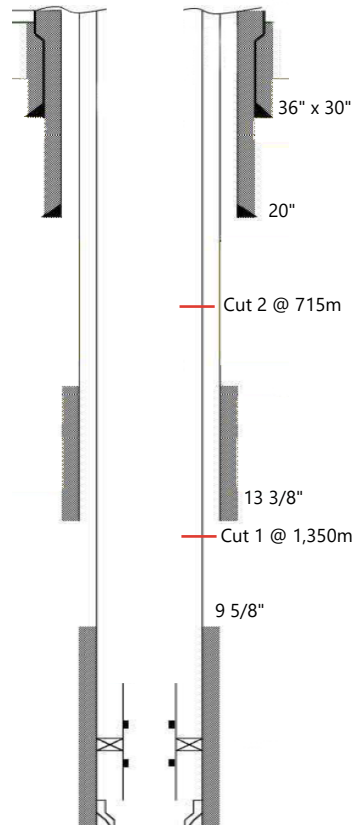
## Ardyne Efficiency Gain

- 4 Trips saved
- 12,000 tripping ft avoided
- 18 Red zone exposures avoided due to single BHA (per person)

NOTE - additional toolbox functionality used\*

- TITAN ran to recover section in settled solids - 18 strokes at 925k lbs jacking force

## Casing Schematic



## Conventional Approach

Rig Activity	
Run 1	Pick Up BHA
	RIH
	Washdown
	Dress Cement
	Pull Out Of Hole Rack BHA
Run 2	Pick Up and test Cutter BHA
	RIH
	Cut Casing
	POOH Rack BHA
Run 3	Pick Up Spear and Pack Off
	RIH to Hanger
	Engage Spear, Attempt to Pull, Attempt to Circulate
	Release Spear, POOH and Rack BHA
Run 4	Pick Up & test Cutter BHA
	RIH
	Cut Casing
	POOH Rack BHA
Run 5	Pick Up Spear and Pack Off
	RIH to Hanger
	Engage Spear & Pack Off, Circulate
	Pull casing to surface

## Ardyne Actual Application

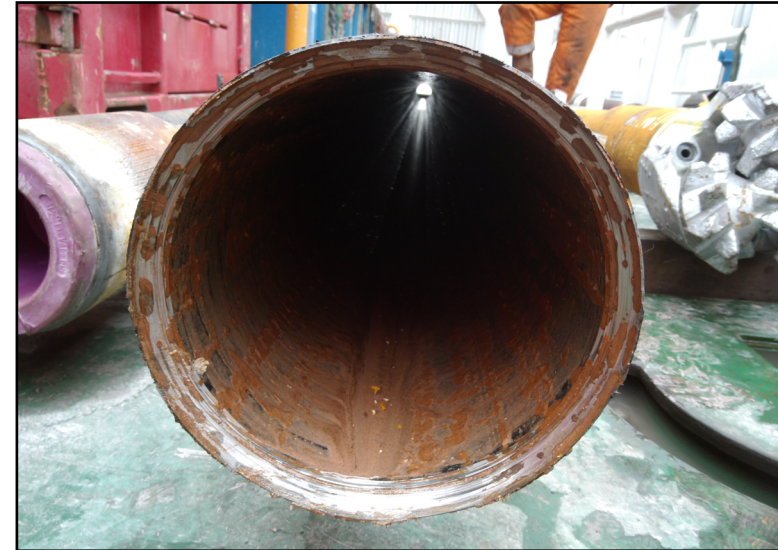
Rig Activity	
Run 1	P/U and test TRIDENT BHA
	RIH with TRIDENT BHA
	Washdown
	Dress Cement & weight test
	Pull Back to Cutting Depth
	Close annular, Cut Casing @ 1350m
	Attempt to Circulate
	Release Packer Pull Back to Hanger
	Attempt to pull casing
	Run Back to 715m
	Close annular, Cut Casing & pick to confirm free
	Set packer & circulate annulus outside casing
	Release Packer & anchor
	Pull Back to Hanger
	Engage Anchor, Pull Casing to Surface

The Ardyne TRIDENT System can complete the well objective in a **single run**, with the ability to switch from cutting and pulling as many times as necessary

## Well Objective Summary

- Dress and weight test cement plug
- Cut 9 5/8", circulate annulus (using TRIDENT Packer) and pull 9 5/8" x 10 3/4" casing from 1,350m
- Recover to surface

*Section of casing recovered during the operation*



## TRIDENT Casing Recovery System - 100+ Runs

