TECHNICAL EVALUATION WORKFLOW



Client engagement flow from planning to execution

Client Information



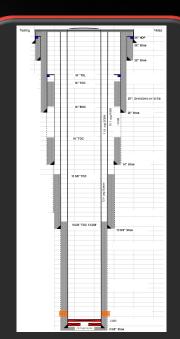
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Client & Ardyne



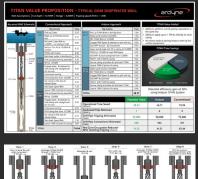
Value

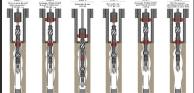


Client Well Info & Objective

Well Schematic Well Objective Project Scope







Ardyne Planning & BHA Design

Time Savings Outline Plan



Ingut - Calculation Cutter / Motor / FRM									
Cut ting Flowrate	284	GPM	Equals	697	LPM				
No alle size Cutter	0.472	in							
Mudweight	9.2	PP8							
Pressure required to open Cutter Initias	38	psi							
Motor	0553	Rw/GPM							
Pressured: op motor - No load Pressure required to flowr shake FRM	349 363	psi	0	275	GPM				
		psi							
No z die size FRM	1000	in							
Gutter	798		6.4		100				
Pressure drop cutter @cutting flowrate	40	grii GPM	fours	152	LPM				
Plowrist et op open knifes TFA Noville Cutter	0.175	sain	tean	152	DM				
Total pressuredrop IP cutting flowrate with nozzle in FRM		nsi			1				
Total presumed rop (i) cutting flowrate with noute in HOM. Total presumed rop (i) cutting flowrate without noute in HOM.	937	psi	0	184	GPM				
Motor	-26	pill							
RPM © Cut ling flowrate 302 RPM									
FRM - No no		10/90							
Flowest erequired to Flowerkers FRM.	113	GPM	Equals	428	LPM				
Province Control Columnia Colu	900	and and							
Person day loss bits at	-	=	0	113	GPM				
FIM -With		_			_				
Flowster equired to Flowrelesse FRM	111	GPM	Equals	419	LPM				
TFA Nozale F RM	0.785	soin	refulf3	419					
Pressure from Cut ter	289	psi							
Pressure from Motor	60	psi	0	111	GPM				
Pressure from not de FRM	14	psi							
Pressured op rozdeFRM @ Cutting flowrate	40	psi		184	GPM				
Pressure calculations below (Can be removed	from calculator - 0	ntytorverific	ations)						
Pressure at flowrate to o	ogen cutterk nifes								
Person day law Curr	38								
Person day law like or	22								
Pressure from not de FRM									
	2	psi		40	GPM				
Total pressure drop without nozdein FRM	2 62	psi	0	40	GPM				
		psi	0	40	GPM				
Total pressure drop without nozdein FRM	62		0	40	GPM				
Total pressure drop without nozdein FRM. Total pressure drop with nozdein FRM.	62		0	40	GPM				
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Total gressore drop without readein FRM. Total gressore drop with neadein FRM. Pressure at flowate to refeat Pressure at flowate to refeat Pressure at flowate to refeat	62 60 se FRM without no 302 61 363	ztle psi							
Load pressure drop with host muschin RRM. This greatest drop with host and sin RRM. Pressure at Sownite to refer	62 60 se FRM withoutno 302 61 363 see FRM with noz	ztle psi							
lood or excussificing with not must kink PRM. Told or excussificing with not after PRM. Precision at Elevanda to reflect Precision at Elevanda to reflect Precision at Elevanda to reflect Find or resourced reports but not desired. Precision at Elevanda to reflect Precisio	62 60 See FRM without no 302 61 363 sase FRM with noze	psi le	0	113	GPM				
It of an executing without market PRM. Load or executing with market PRM. Presence at Rewards to reflect Presence at Reward	62 60 see FRM without no 30.2 61 36.3 see FRM with nous 0	ztle psi							
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The digital and the problem of the Common of	62 60 60 60 60 60 61 61 65 60 0 0 0 0 0 0 0 0 ng flowste 728	psi le	0	113	GPM				
The department of the partment of the Management	62 60 60 60 60 60 60 60 60 60 60 60 60 60	psi le	0	113	GPM GPM				
This present is a which calculate TMS in the present is a first in the TMS in	62 60 60 302 61 363 363 61 963 90 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	psi le	0	113	GPM				
The department of the partment of the Management	62 60 60 60 60 60 60 60 60 60 60 60 60 60	arle psi le psi	0	113	GPM GPM				

Ardyne / Client Review

Risk Assessment Detailed Procedures Joint Service Delivery Plan





Executable Objectives

HSE Benefit Efficiency Rig Time Saving Operational Reliability



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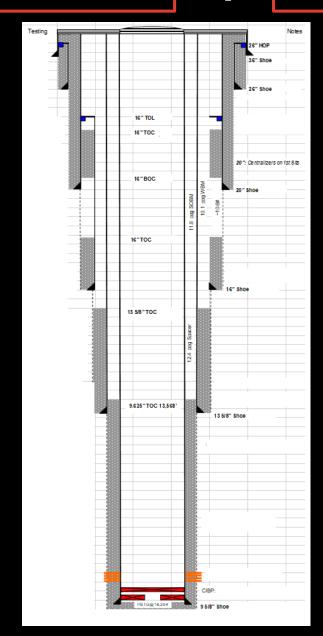


Value

CLIENT PROVIDES...

Example well schematic from customer:

- 1. Cut and Pull 9-5/8" (conventionally)
- 2. Cut and Pull 13 5/8 (conventionally above shoe)
- 3. Recover Casing from open hole (TITAN)



	Drill 500ft Cmt Plug, Cut and Pull 9	
Job Type: #1	5/8	
Hanger Depth (ft)	2505	
Cut Depth (ft)	4550	
Casing Size	9 5/8	
Casing Weight (lb/ft)	53.5	
Grade	Q125	
Connection	SLX	
Mud Weight PPG	11.5	
Length to Recover (ft)	2045	
Buoyant Weight to Recover (lb)	90,185	
*DO NOT CUT Outer casing		

Job Type: #2	Cut and Pull 13 3/8
Hanger Depth (ft)	2505
Cut Depth (ft)	3038
Casing Size	13 3/8
Casing Weight (lb/ft)	72
Grade	Q125
Connection	SLX
Mud Weight PPG	11.5
Length to Recover (ft)	533
Buoyant Weight to Recover (lb)	31,633
*DO NOT CUT Outer casing	

Client Information



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Client & Ardyne

Value

ARDYNE PREPARES...

Value Proposition

- Highlight rig time saved
- o Additional benefits, HSE value
- Outline plan

Operational Sequence Poster

- o BHA
- Visual step-by-step operation
- Tool functions

TITAN VALUE PROPOSITION - TYPICAL GOM DEEPWATER WELL

Well Assumptions | Cut depth = 12,700ft | Hanger = 6,500ft | Tripping speed (ft/hr) = 1,500



Assumed Well Schematic Conventional Approach Rig Activity Time 0.50 Pick up Cutter Make up to TDS & function 0.75 RIH with Cutter BHA to 8.40 12,600ft - cut casing in half. Perform Cut #3 at 12,600ft & 0.75 confirm POOH with Cutter 8.40 Rack back cutter in the Derrick 0.50 Stroked Pick up Spear/Jarring assembly to pull RIH to 12,500ft 8.33 0.50 free casing with straight pull 4.00 Pull Casing free from 12,600ft 9.17 0.75 1.50 Rack back Spear BHA Layout 100ft (3 joints) of casing 2.50 Pick up Spear/Jarring assembly Cutter RIH to 12,600ft 8.40 free casing with straight pull 0.50 Pull Casing free from 12,700ft Set casing in the slips &

release Spear

Bridge

TOTAL

Rack back Spear BHA

Layout 100ft (3 joints) of casing

0.00

74.94

	Ardyne Approach		ı
	Rig Activity	Time	
Run 1	Pick up TITAN BHA to the Rig Floor	1.00	
24.57	Make up & function test BHA	1.50	
	RIH TITAN BHA to 12,500ft	8.33	
	Engage FRM Spear & attempt to pull with rig	0.50	
	Set DHPT & Jack - No movement	0.50	
	Space out & make Cut #3 in casing at 12,600ft	1.00	
	POOH to 12,500ft & reset FRM Spear	0.50	
	Set DHPT & Jack casing free from 12,600ft	1.00	
	POOH with TITAN & casing	9.24	
	Secure casing at surface & rack back TITAN	1.00	
	Layout 100ft (3 joints) of casing	0.00	
Run 2	Make up & function test BHA	1.50	
22.14	RIH TITAN BHA to 12,600ft	8.40	
	Engage FRM Spear & attempt to pull with rig	0.50	
	Set DHPT & Jack free	1.50	
	POOH with TITAN & casing	9.24	
	Secure casing at surface & rack back TITAN	1.00	
	Layout 100ft (3 joints) of casing	0.00	
TOTA		46 71	ı

	casing No heavy loads or jarring impacts seen by the surface equipment
	TITAN Time Savings
	Conventional hours per well - 74.94 Ardyne hours per well - 46.71
	Hours saved per
	well - 28.23
$\ $	■ Conventional ■ Ardyne ■ Hours Saved

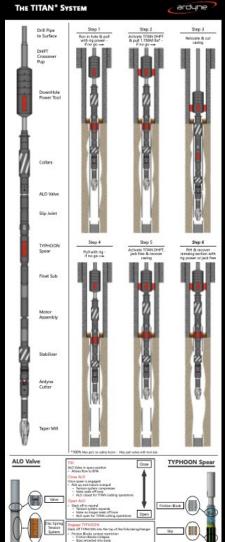
TITAN Value Added

Ability to perform cuts & jacking operations in

Ability to apply up to 1.7M lbs directly to stuck

Potential efficiency gain of 38% using Ardyne TITAN System

TOTAL	46.71	using Ardylle THAN System	
	Potential Value	Ardyne	Conventional
Operational Time Saved (Hours)	28.23	46.71	74.94
Dedicated Trips Removed (BHA's)	1	2	3
Drill Pipe Tripping Eliminated (Feet)	25,000	50,400	75,400
Drill Pipe Connections Eliminated (Feet)	269	542	811
Red Zone Occupation Reduced - BHA Handling/Tripping (Hours)	21.23	41.21	62.44



Changeable Nazde

Client Information



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Value

CLIENT & ARDYNE COLLABORATE ON...

Risk Assessment

- Simulations
- Contingency plans

Detailed Procedures

- Pre-job checklist
- Detailed BHA
- Operation steps
- Optimum parameters



Operation Sequence for Setting Bridge Plug, Cut & Pull

SERVICE A: FOR 9-5/8" - 9-7/8" CASING

1. P/U and M/U the BHA below:

Qty	Description	Connections	Vendor
1	9-5/8" / 9-7/8" Bridge Plug		100000
1	Bridge Plug Running Tool	TBC	
1	Crossover	4 1/2 Reg Pin x TBC	
1	9 5/8" TRIDENT Cutter	6 5/8 Reg Box x 4 1/2 Reg Box	Acdyne
1	9 5/8" TRIDENT Anchor	NCS0 Box x 6 5/8 Reg Pin	Acdyne
1	5 1/4" Pup Joint	5 1/2 FH Box x NCS0 Pin	
1	Crossover	NCS0 Box x 5 1/s FH Pin	
1	9 5/8" TRIDENT Packer	NCS0 Box x Pin	Acdyne
1	5 1/4" Pup Joint	5 1/2 FH Box x NC50 Pin	
1	Crossover	NCS0 Box x 5 1/2 FH Pin	
1	6 1/4" Lubricated Bumper Sub	NC50 Box x Pin	
1	Crossover	5 1/2 FH Box x NCS0 Pin	
TBC	DP to surface	5 1/2 FH DSTJ Box x Pin	

- 2. RIH to bridge plug setting depth. Set bridge plug as per procedure.
- 3. Tag with 10 kips weight to verify bridge plug depth.
- 4. Pull back a stand.
- 5. Close BOP and perform positive test. (Alternatively, the TRIDENT Packer can be used for the pressure test)
- 6. Pick up and relocate the cutter knives at cutting depth.
- Start circulation to activate the TRIDENT Anchor.
- 8. Pick up, overpull 20 T and maintain. Stop circulation
- 9. Record parameters and start rotation 80 100 rpm.
- 10. Start circulation to activate Tempest Cutter
- 11. Cut 9-5/8" / 9-7/8" casing until cut indication is observed.
- 12. Stop circulation and rotation.
- 13. Pick up casing hanger and casing and set Packer.
- 14. Start circulating behind the 9-5/8" / 9-7/8" casing to clean the annulus.
- 15. Slack off and release the Anchor and allow the Packer to relax.
- 16. Pick up and relocate the TRIDENT Anchor to below the casing hanger in wellhead.
- 17. Start circulation (approx, 300 gpm) to activate the TRIDENT Anchor.
- 18. Pick up, overpull 20 T and maintain.
- 19. Stop circulating, then POOH 9-5/8" / 9-7/8" casing hanger and casing to surface.
- 20. L/D 8HA and casings.

Additional dedicated run required to perform cement plug

Input - Calculation Cutto	er / Motor / FRM								
Cutting Flowrate	184	GPM	Equals	697	LPM				
Nozzle size Cutter	0.472	in							
Mudweight	9.2	ppg							
Pressure required to open Cutter knifes	38	psi							
Motor	0.553	Rev/GPM							
Pressuredrop motor - No load	149	psi	@	275	GPM				
Pressure required to flow release FRM	363	psi	-						
Nozzle size FRM	1.000	in							
OZZIE SIZE HRM 1,000 IN Cutter									
Pressure drop cutter @ cutting flowrate	798	psi	Equals	55	bar				
Flowrate top open knifes	40	GPM	Equals	152	LPM				
TFA Nozzle Cutter	0.175	sq.in	Equals	132	LITTU				
Total pressure drop @ cutting flowrate with nozzle in FRM	937	psi							
Total pressure drop @ cutting flowrate with nozzle in FRM	898	psi	@	184	GPM				
Motor		psi							
RPM @ Cutting flowrate	102	RPM							
FRM - No no									
Flowrate required to Flowrelease FRM.	113	GPM	Equals	428	LPM				
Pressure drop from Cutter	302	psi							
Pressure drop from Motor	61	psi	@	113	GPM				
FRM - With r		P							
Flowrate required to Flowrelease FRM	111	GPM	Equals	419	LPM				
TFA Nozzle FRM	0.785	sq.in	Lyuais	413	LI IVI				
Pressure from Cutter	289	psi	@	111					
Pressure from Motor	60	psi			GPM				
Pressure from nozzle FRM	14	psi							
Pressuredrop nozzle FRM @ Cutting flowrate	40	psi	@	184	GPM				
Tressured op nozzer kin @ cutting nowrate	40	psi	<u>w</u>	104	OI W				
Pressure calculations below (Can be removed	from calculator - C	Only for verific	ations)						
Pressure at flowrate to o	pen cutter knifes								
Pressure drop from Cutter	38								
Pressure drop from Motor	22				GPM				
Pressure from nozzle FRM	2	psi	@	40					
Total pressure drop without nozzle in FRM	62								
Total pressure drop with nozzle in FRM	60								
Pressure at flowrate to release	se FRM without no	zzle							
Pressure drop from Cutter	302								
Pressure drop from Motor	61	psi	@	113	GPM				
Total pressure drop without nozzle in FRM	363								
Pressure at flowrate to release FRM with nozzle									
Pressure drop from Cutter	0								
	0	psi	osi @	0	GPM				
Pressure drop from Motor		Pai	٣						
Pressure drop from Motor Pressure from nozzle FRM	0				1				
	0								
Pressure from nozzle FRM	0								
Pressure from nozzle FRM Total pressure drop with nozzle in FRM	0								
Pressure from nozzleFRM Total pressure drop with nozzle in FRM Pressure at cuttin	0 ng flowrate								
Pressure from nozzleFRM Total pressure drop with nozzle in FRM Pressure at cuttin Pressure drop from Cutter	0 ng flowrate 798	psi	@	184	GPM				
Pressure from nozzleFRM Total pressure drop with nozzle in FRM Pressure at cuttin Pressure drop from Cutter Pressure drop from Motor	0 ng flowrate 798 100	psi	@	184	GPM				





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Value



- Reduce pipe handling
- Reduce time in red zone
- Reduce risk by doing less



Rig Time Saving

- Multi-purpose single-trips
- Casing cut verification
- On-demand reattempts



Operational Reliability

- Pre-job planning
- Field proven technology
- Operational planning experience

TRIDENT = 130 + Runs



TITAN/DHPT = 1,100 + Runs



