



DULANG B20L ADDENDUM#4

Revision: 0
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Date Prepared: 23th May 2023
Well: B-20L
Field: DULANG
Operation Region: PMA
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DIMENSION BID

DIMENSION BID
COILED TUBING SERVICES




DULANG B-20L

SAND CLEANOUT

DESIGN VERIFICATION

PREPARED BY DB
CTS Operation Engineer



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23/05/2023

Date

REVIEWED BY DB
CTS Technical Advisor



Kung Yee Han

23/05/2023

Date

APPROVED BY DB
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23/05/2023

Date

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Date

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M. Izwan B. A. Jalil

Date

APPROVED BY PCSB
Head of Cluster 2
Well Intervention, PMA

Asraf M Nazri

Date

Remark: Do not execute the procedures in this document if it is not fully approved and signed by all parties.

Prepared By:
Muhammad hafiz


Reviewed By:
Kung Yee Han

Date:
23/5/2023

Rev.
Rev0

Controlled Document
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Pg.
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OVERVIEW

After CTU complete CT Run#3 (Addendum) cleanout until top of tubing stop, slickline attempt to retrieve tubing stop but failed. After further discussion, way forward is to retrieve the lower tubing stop using CT.

OBJECTIVES

The objective of this addendum is to;

1. To perform CT Fishing –retrieve lower tubing stop.

OPERATIONAL PROCEDURE

CT RUN# ADDENDUM 4: TUBING STOP RETRIEVAL AT DEPTH 1,458m / 4,784ft MDTHF.

NOTE: Ensure to shut-in well B20S prior commence fishing operation

Conduct safety meeting with all personnel on location detailing the program, pressure limitations, personnel responsibilities, emergency well control drill, and safety precautions.

1. Prepare 100bbbls of Treated Injection Water, TIW as per recipe below:

Treated Injection Water (TIW)				100	BBL	Description
Seq.	Product	Concentration		Volume		
1	Injection Water	994	gptg	4,175	gal	Base Fluid
2	ACM H2S Clear 200	2	gptg	8	gal	CO2 & H2S Corrosion Inhibitor
3	ACM BACT 200	2	gptg	8	gal	Micro Biocide Control
4	ACM OXYFREE 100	2	gptg	8	gal	Oxygen Scavenger
Mixing Instruction: <ol style="list-style-type: none"> a) Prepare Injection Water into the mixing tank. b) Add ACM H2S Clear 200 into the tank and circulate the mixture. c) Add ACM BACT 200 & ACM OXYFREE 100 into the tank and circulate the mixture until homogenous. 						

Note: The above recipe is for 100bbbls of TIW. Please prepare another batch of Treated Injection Water once needed.

2. Make up Fishing tool as per BHA#1: " Flow Release JDC in Appendix I

NOTE: Take the Full BHA measurement and record in the DOR, perform surface pull test on connector 25k lbs.

3. Perform function test of the JDC flow release tool to determine pump rate & pressure parameter for the grapples to retract (release mode). Record the data in the table below, do not exceed 5,000psi

Flow rates (bpm)	Pressure (psi)	Remark
0.3		
0.5		
0.7		
1.0		
1.1		
1.3		

4. Box up to connect the riser and prepare for pressure test.
5. Pick up CT and tag BHA with the stripper.
6. CT stack up pressure test against Wellhead Crown valve. Pumping treated injection water through the CT, apply low pressure test of **300 psi for 5 minutes** and high-pressure test of **3,000 psi for 15 minutes** after stabilization. Record the pressure test. Record test on a chart. Upon successful pressure test, bleed off pressure via Pump-In Sub.
 - 6.1. For low pressure:

Acceptance criteria: No visible leaks. Pressure drop is less than 10% (above 270 psi) over 5-minutes test interval after the pressure stabilizes.
 - 6.2. For high pressure:

Acceptance criteria: No visible leaks. Pressure drop is less than 10% (above 2,700 psi) over the 15- minutes test interval after the pressure stabilizes.

7. Pressure tests the BHA Check Valve. With **3,000 psi** in the CT stack up, bleed off the stack up pressure to **1,500 psi** via pump-in sub; and bleed off pressure in the CT to zero (0) psi via reel manifold.
 - 7.1. Acceptance criteria: **Pressure drop is less than 10% (above 1,350 psi) over the 15- minute test interval after the pressure stabilizes.** Observe for any pressure changes in the stack up. If the BHA check valve is not holding, proceed to replace the MHA; do not RIH with leaking check valve; repeat steps 6 and 7.
8. Upon successful test, bleed off the pressure in the CT stack up to zero through the pump-in sub.
9. Zero both depth counters (Orion and Mechanical) at reference point.
10. Confirm all wellhead and BOP valves are in open position via physical check.
 - 10.1. Prior opening the wellhead valve, pressure up above master valves to a pressure equal to the expected shut-in wellhead pressure.
 - 10.2. Count and record wellhead valves turns while opening and record it the operation report for reference in future.

CV Opening Turns	LMV Opening Turns

- 10.3. Record initial SITHP and PCP in the Daily Operation Report (DOR).
- 10.4. Manipulate surface valve to the following position:

Valve	Position
Reel Manifold	OPEN
Flow Cross Return Valve (Cetco lines)	OPEN
Wing Valve	CLOSE

11. Start RIH BHA to 1,458m / 4,784ft MDDF without pumping
 - 11.1. Refer to CT Tubing Force simulation (Orpheus modelling), refer **Appendix section.**
 - 11.2. Conduct pull test as per for every 300m (1,000ft), use CT Fatigue graph as reference. Break circulation every 1000 ft @ 0.3 bpm.


Ensure the CT Fatigue graph is available at location before RIH. Record RIH, Hanging and POOH weight in treatment report.
 - 11.3. Maximum coil speed running in hole is **30-50 ft/min.**
 - 11.4. Slow down coil speed to **10 ft/min**, 50 ft before and after passing through completion accessories.
 - 11.5. Closely observe weight indicator in control cabin while running in hole.
 - 11.6. Observe return all the times.
 - 11.7. Do not exceed operating safety limits **5,000 psi.**

Notes: - Burst disc installed in circulating sub is rated to 5,000 psi.
 - 11.8. If the well condition differs from original job design, contact appropriate personnel in charge before proceeding.
 - 11.9. At all time, while RIH, the injector torque control shall be set at the minimum pressure required to move the CT at specified speed.
12. Prior reaching 10m above top of tubing stop at 1,448m / 4,751ft - MDDF, monitor and record RW and PW for the string.

Depth	RIH weight, lbf	Static weight, lbf	Pick up weight, lbf

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13. Once complete pull test, continue RIH slowly at 10 ft/min and tag the tubing stop without pumping (Do not slack off more than 1,000lbf – surface). Increase pumping rate to release mode, and pick up BHA 10ft above plug, to neutral CT weight and station BHA.
14. Increase pumping rate as per function test on surface to activate JDC FR pulling tool
15. RIH slowly tag top of tubing stop with <1,000 lbs (surface), stop pumping and pick up CT. Apply overpull with CT in stages (500-1,000 lbs). If observed overpull, indication that JDC successfully latched to tubing stop.
16. If there were no overpull observed, there is possibility that JDC was unsuccessful to latch and retrieve prong: -
 - 16.1. Increase set down weight
 - 16.1.1. Pick up BHA 10m above top of prong, start pump as per function test on surface to activate JDC FR tool.
 - 16.1.2. RIH to top of tubing stop and apply an increase set down weight of 1,000-1,800lbf (surface), and stop pumping.
 - 16.1.3. Pick up BHA to observe if there is any over pull to indicate tubing stop is successfully latched. If no positive indication, continue with 16.2.
 - 16.2. RIH BHA at a higher running speed
 - 16.2.1. Pick up BHA to 15m above tubing stop.
 - 16.2.2. RIH to top of tubing stop at a higher speed than normal (actual number to be confirm at site by Wellpro Supervisor and agreed on by PCSB WSS) to latch onto the tubing stop (pumps off).
 - 16.2.3. Pick up BHA to observe if there is any over pull to indicate tubing stop is successfully latched. Continue with step 16.3 If no positive indication.
 - 16.3. Clean top of tubing stops from any possible debris and sand
 - 16.3.1. Pick up BHA 10ft above the prong
 - 16.3.2. Slowly RIH to top of prong while pumping 5bbls of D801 system at maximum pumping rate
 - 16.3.3. Proceed to bottoms up with 10 bbls TIW
 - 16.3.4. Upon completion bottom up, stop pumping and re-attempt to latch by repeating step 15 and 16 **(If necessary)**
 - 16.4. Acid soaking to remove any possible scale build up around tubing stop.
 - 16.4.1. Pick up BHA 10ft above the prong
 - 16.4.2. Mix 5 bbl 15% HCL, after complete mixing, close return valve. Jetting 3 bbls (idle rate) of HCL on top of tubing stop and spot remaining 2 bbl acid (pick up after 0.3 bbl outside the nozzle) while pick up at safe depth, 1000 ft above, soaking for 2-hour soaking.
 - 16.4.3. Once complete 2-hour soaking, open the return valve at surface, and start to flow back the acid. RIH (while pumping) to top of tubing stop and CBU 1 tubing volume.
Noted High chance unable to recover acid at surface due to low reservoir pressure.
 - 16.4.4. Upon completion bottom up, stop pumping and re-attempt to latch by repeating step 15 and 16 **(If necessary)**

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17. Over pull to establish engagement of retrieval tool (Approximately 2,000 to 3,000lbs – surface) without firing the jars. If tubing stop is free, POOH BHA to surface
18. If the tubing stop is still unable to free, RIH to set down weight to reset the jar and take over-pull (approximately 3,000lbs – surface) and fire the jars – noting time of detent delay mechanism. Repeat this step up to 5 times with increasing overpull (DO NOT exceed 80% CT Pick up limit)

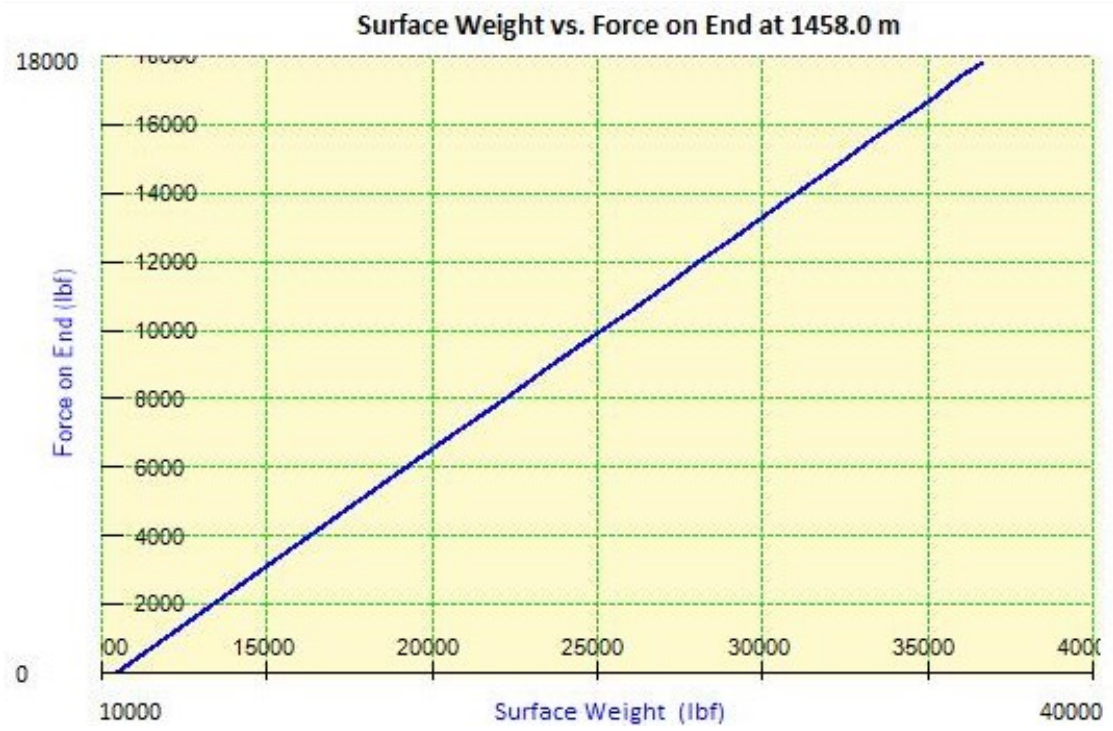
Wellpro Tool Specialist to advise based on onsite parameters

NOTE: If pumping has been performed, shut down pumps and allow pressure to stabilise and bleed before picking up.

19. If tubing stops still unable to be latched and retrieved after multiple attempts, consult town for way forward.
20. If town agreed to re-attempt, proceed to increase over-pull in 1,000lbf increments (surface) – noting time of delay (i.e., shorter delay for larger over-pull), until the prong is free. Never exceed 80% of the yield of the CTU string or 80% of the maximum allowable over-pull on the B.H.A., whichever is the less.
21. If the tool string is released (normal string weight is observed on weight gauge), proceed POOH to surface.
22. If the tool string remains unreleased, slack off weight to re-cock the jar and repeat an over pull indicated in the table below;

Weight Gauge Reading before over pull (lbf)	Over pull at surface (lbf)	Weight Gauge Reading after over pull (lbf)	Pipe movement (ft)	No. of Attempt
	5,000			
	6,000			
	7,000			
	8,000			
	9,000			
	10,000			

Table of parameters during jarring



23. When the tubing stop is 'free, it is not recommended to slack off weight back down on the tubing stop.
24. POOH BHA to surface.
25. Once CT at surface, box up and release the tubing stop from overshot tool.

In the event unable to retrieve the tubing stop using FR JDC, discuss with town and WSS, if everyone agreed proceed to make up Bulldog Spear configuration, BHA#2 Configuration in appendix Section and repeat from step 2 in this addendum.

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APPENDIX I – BHA SCHEMATIC

BHA#1: FR JDC

<h2 style="margin: 0;">DIMENSION BID</h2> <h3 style="margin: 0;">BHA DIAGRAM#1 ADDENDUM#4 - FR JDC</h3>							
Client	Petronas Carigali	Well	B-20L				
Field	Dulang Bravo	Min Restriction					
Job Type	CT Fishing	BHP	700 PSIG (E7/8)				
Job No.	CT Run#4	BHT	216 degF				
BHA DRAWING	DESCRIPTION	CONNECTION		ID INCH	OD INCH	TOOL LENGTH FT	CUMULATIVE LENGTH FT
		UPHOLE	DOWNHOLE				
	Dimple CT Connector	1.5" CT	1.0" AMMT PIN		1.690	0.3	0.3
	MHA Disconnect drop ball 5/8" Circulating drop ball 1/2" Burst Disc 5000 psi	1.0" AMMT BOX	1.0" AMMT PIN		1.690	2.3	2.6
	NRT Stabilizer (Optional)	1.0" AMMT BOX	1.0" AMMT PIN		2.000	1.6	4.2
	Dual Acting Accelerator	1.0" AMMT BOX	1.0" AMMT PIN		1.690	5.7	9.9
	Dual Acting Hydraulic Jar	1.0" AMMT BOX	1.0" AMMT PIN		1.690	5.62	15.52
	Lower hydraulic disconnect Circulating drop ball 3/8"	1.0" AMMT BOX	1.0" AMMT PIN		1.690	5.0	20.5
	Crossover	1.0" AMMT BOX	1.5" AMMT PIN		2.125	0.33	20.9
	FR JDC	1.5" AMMT BOX			2.180	1.5	22.0
BHA LENGTH						21.98	
MAXIMUM OD						2.125	
MINIMUM ID							

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BHA#2: FR Bulldog Spear

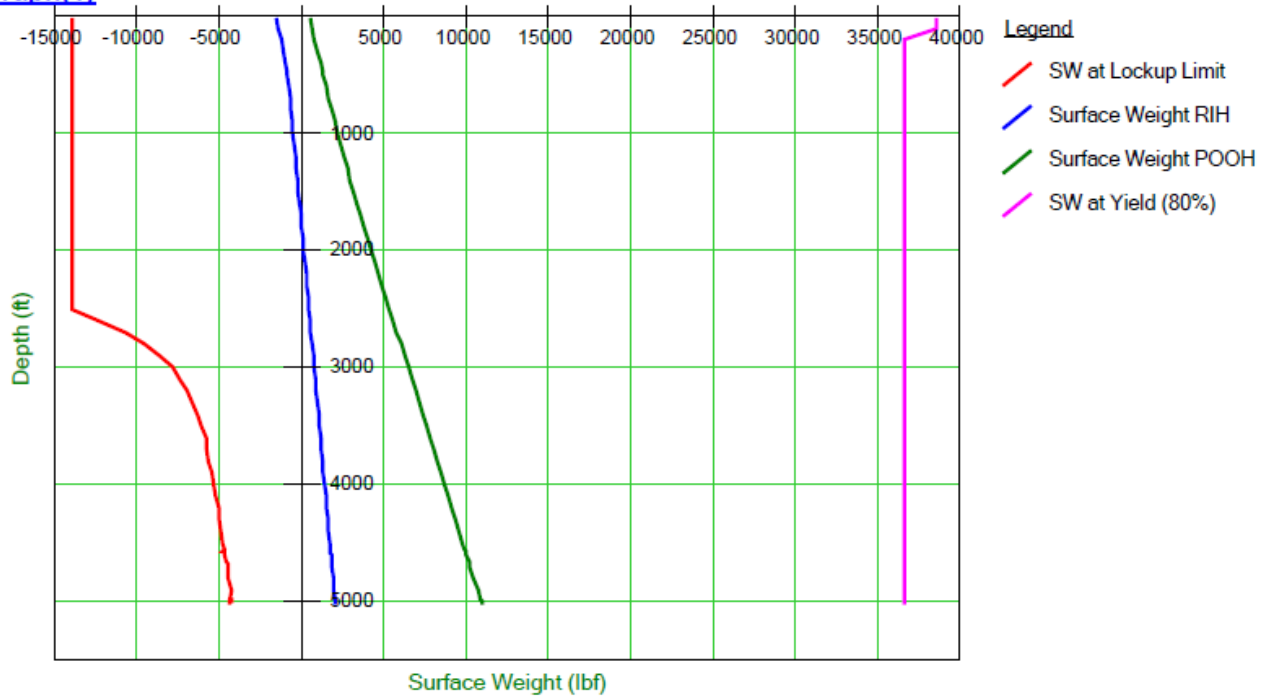
<h2 style="color: green; margin: 0;">DIMENSION BID</h2> <h3 style="margin: 0;">BHA DIAGRAM#1 ADDENDUM#4 - FR JDC</h3>							
Client	Petronas Carigali	Well	B-20L				
Field	Dulang Bravo	Min Restriction					
Job Type	CT Fishing	BHP	700 PSIG (E7/8)				
Job No.	CT Run#4	BHT	216 degF				
BHA DRAWING	DESCRIPTION	CONNECTION		ID	OD	TOOL LENGTH	CUMULATIVE LENGTH
		UPHOLE	DOWNHOLE	INCH	INCH	FT	FT
	Dimple CT Connector	1.5" CT	1.0" AMMT PIN		1.690	0.3	0.3
	MHA						
	Disconnect drop ball 5/8"	1.0" AMMT BOX	1.0" AMMT PIN		1.690	2.3	2.6
	Circulating drop ball 1/2"						
	Burst Disc 5000 psi						
	NRT Stabilizer (Optional)	1.0" AMMT BOX	1.0" AMMT PIN		2.000	1.6	4.2
	Dual Acting Accelerator	1.0" AMMT BOX	1.0" AMMT PIN		1.690	5.7	9.9
	Dual Acting Hydraulic Jar	1.0" AMMT BOX	1.0" AMMT PIN		1.690	5.62	15.52
	Lower hydraulic disconnect	1.0" AMMT BOX	1.0" AMMT PIN		1.690	5.0	20.5
Circulating drop ball 3/8"							
Crossover	1.0" AMMT BOX	1.5" AMMT PIN		2.125	0.33	20.9	
FR Bull dog Spear	1.5" AMMT BOX			2.000	1.8	22.4	
BHA LENGTH						22.35	
MAXIMUM OD						2.125	
MINIMUM ID							

APPENDIX II – ORPHEUS SIMULATIONS

TFA (0.3 BPM) – IDLE RATE

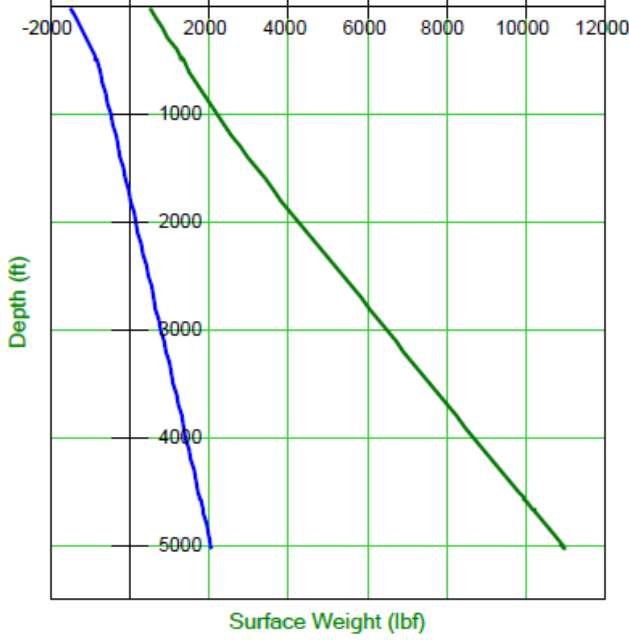
TUBING FORCE ANALYSIS AT 1,533m / 5,030ft MDDF

Graph(1)

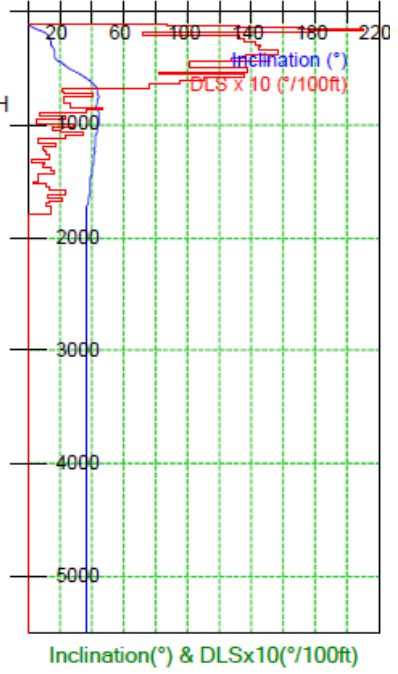


RIH & POOH WEIGHT

RIH and POOH
between 0 ft and 5030 ft

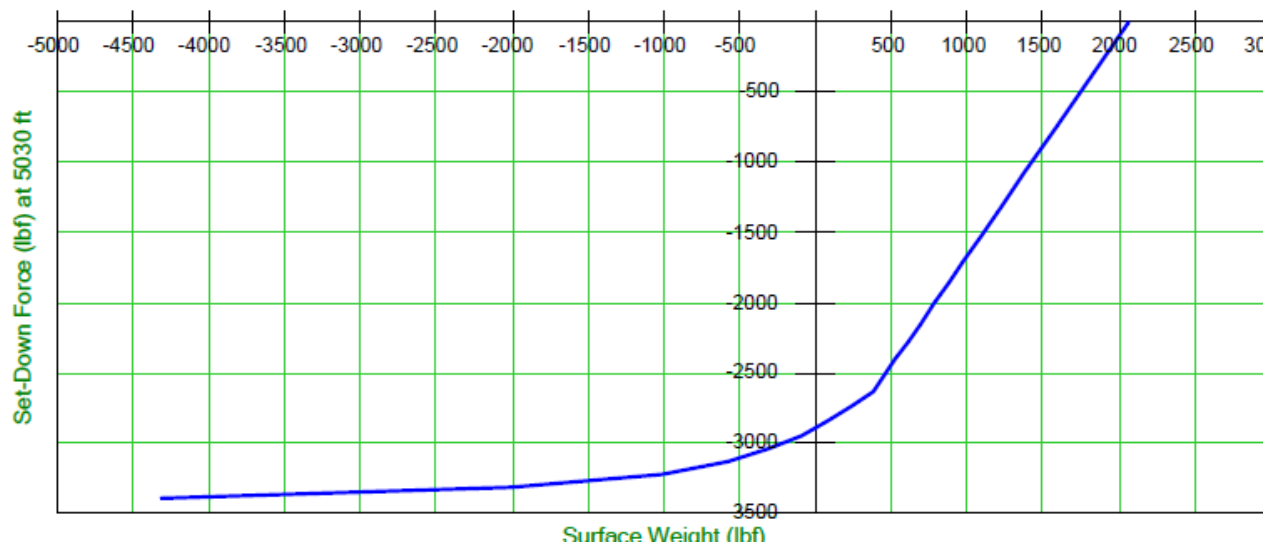


- Legend**
- Surface Weight RIH
 - Surface Weight POOH



MAXIMUM STRING SET DOWN LIMIT

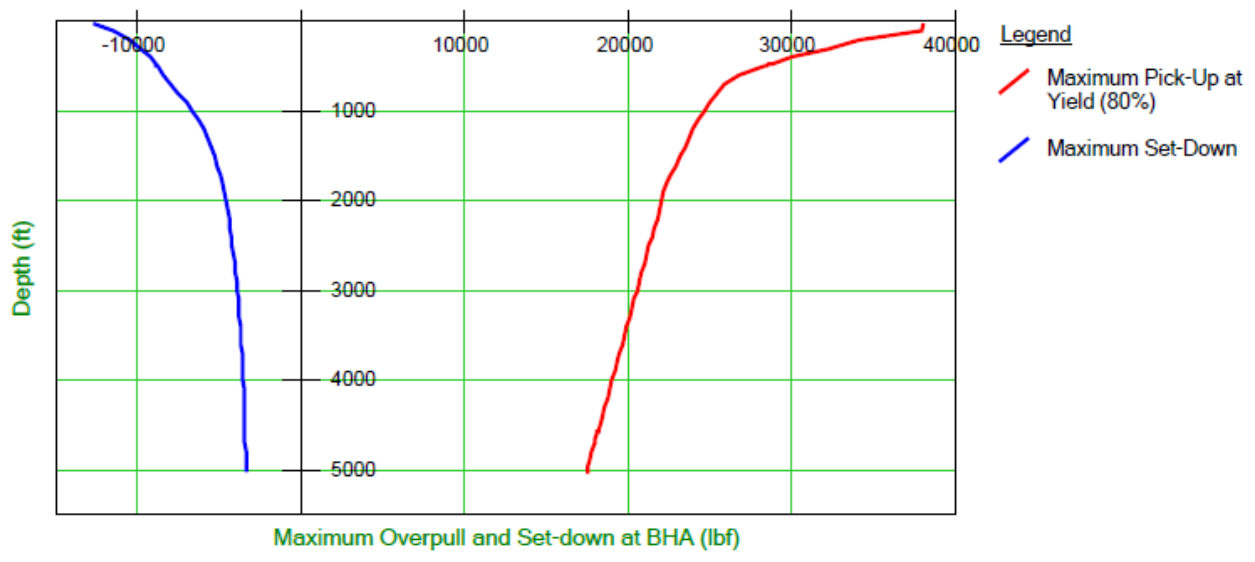
MD3 ■ The available set-down force at 5030 ft is -3399 lbf at the end of the string.
The weight indicator reading will be -4316 lbf on surface.



MAXIMUM STRING PICK UP LIMIT

Calculations at 5030 ft

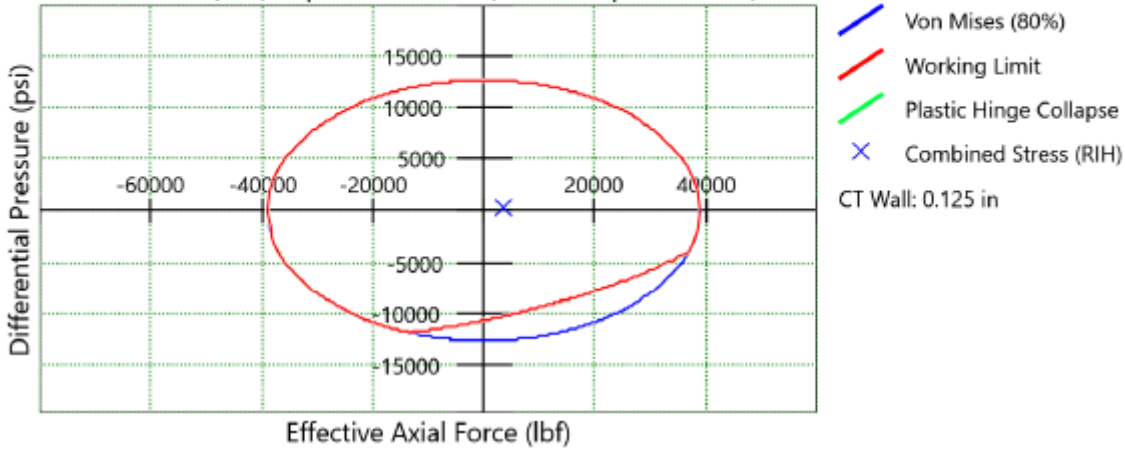
MD1 ■ The available pick-up at 5030 ft based on 80% of yield strength is 17451 lbf.
The weight indicator reading will then be 36666 lbf.



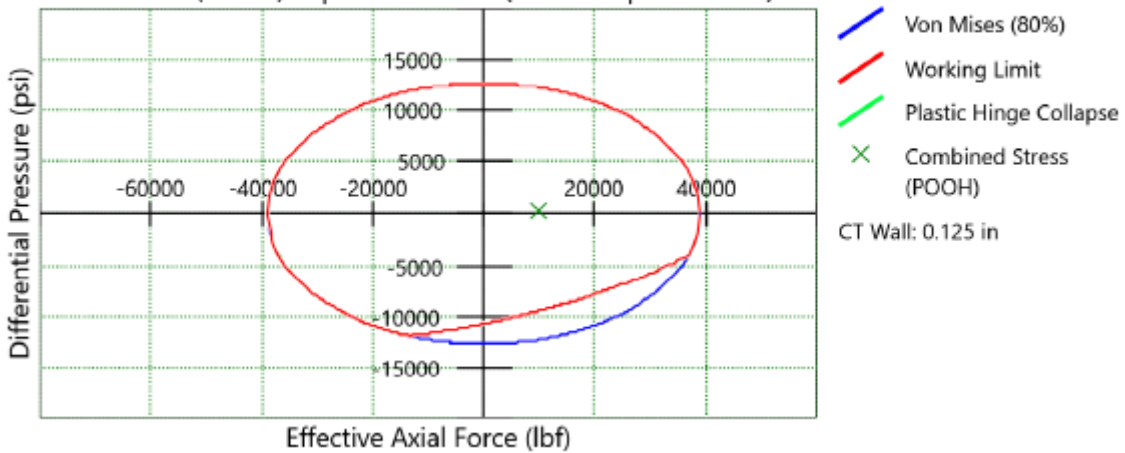
STRING LIMIT

CT Limits

CT Limits (RIH) at position: 155 ft (at Run Depth=5030 ft)



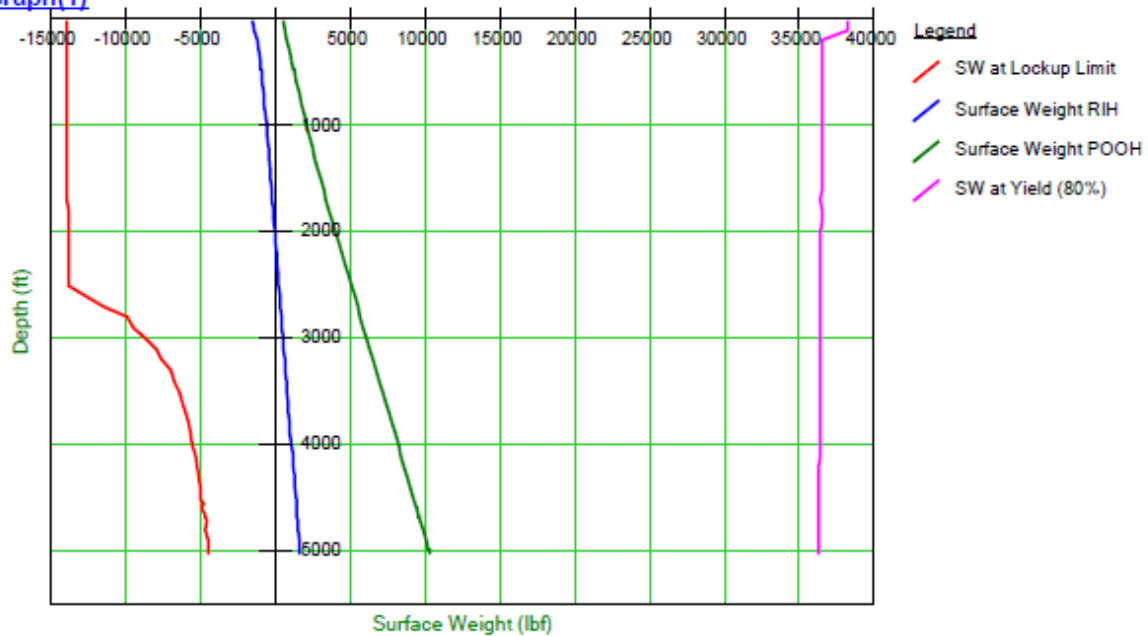
CT Limits (POOH) at position: 155 ft (at Run Depth=5030 ft)



TFA (1.0 BPM) – HIGH RATE

TUBING FORCE ANALYSIS AT 1,533m / 5,030ft MDDF

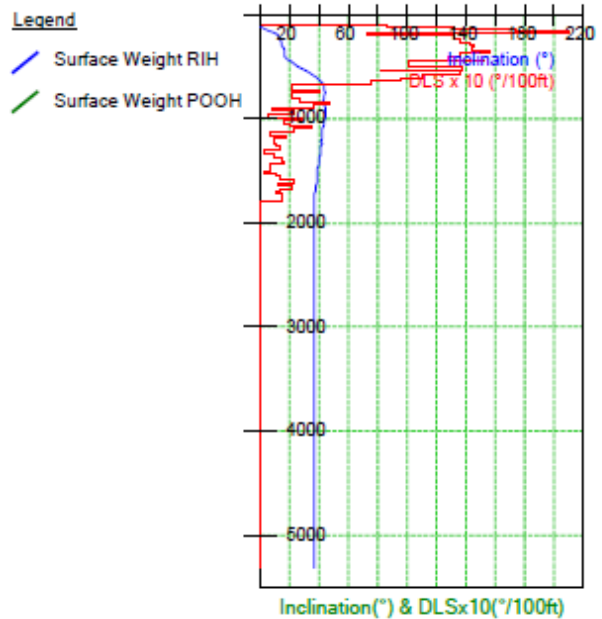
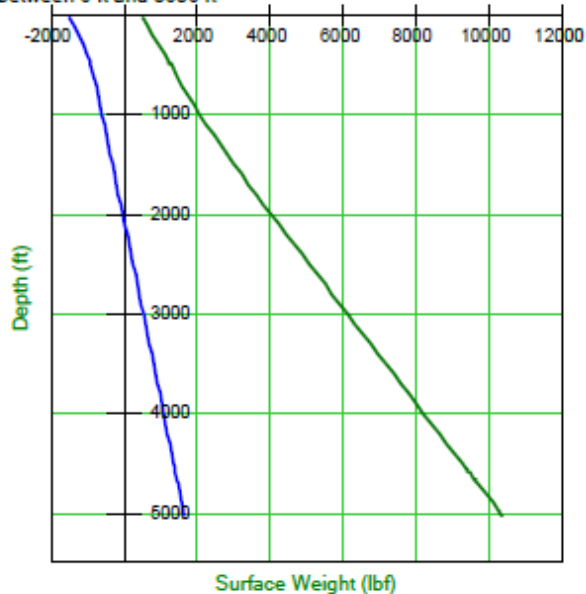
Graph(1)



RIH & POOH WEIGHT

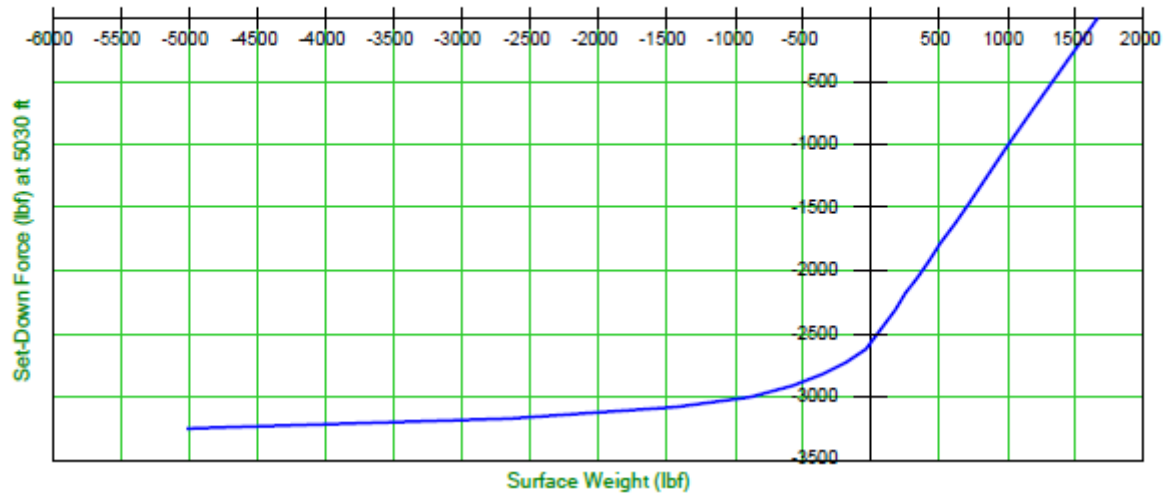
RIH and POOH

between 0 ft and 5030 ft



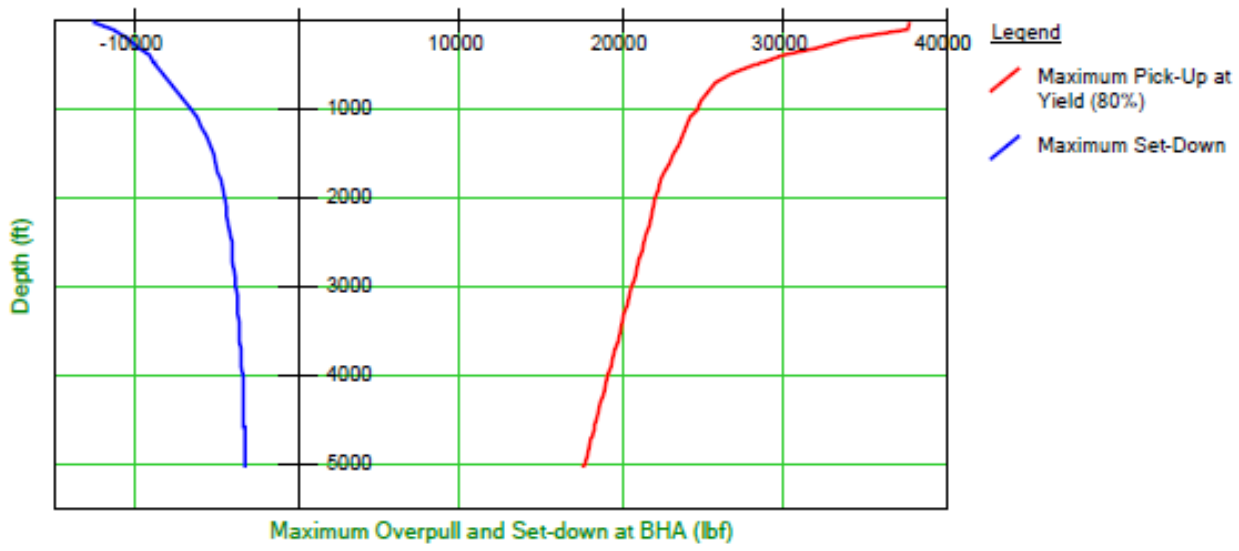
MAXIMUM STRING SET DOWN LIMIT

MD3 ■ The available set-down force at 5030 ft is -3254 lbf at the end of the string.
The weight indicator reading will be -4441 lbf on surface.



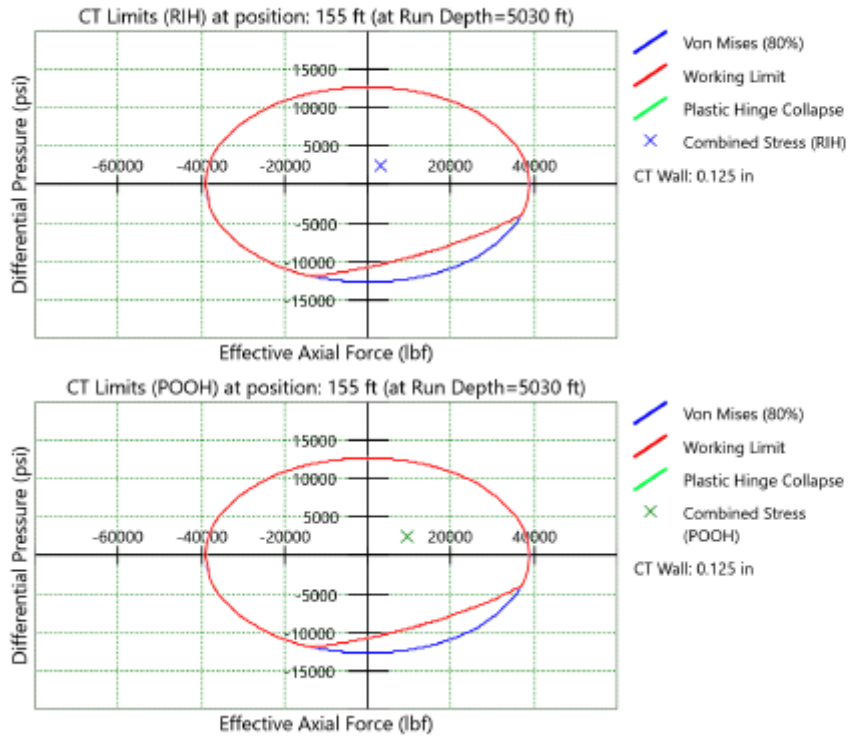
MAXIMUM STRING PICK UP LIMIT

MD1 ■ The available pick-up at 5030 ft based on 80% of yield strength is 17627 lbf.
The weight indicator reading will then be 36302 lbf.



STRING LIMIT

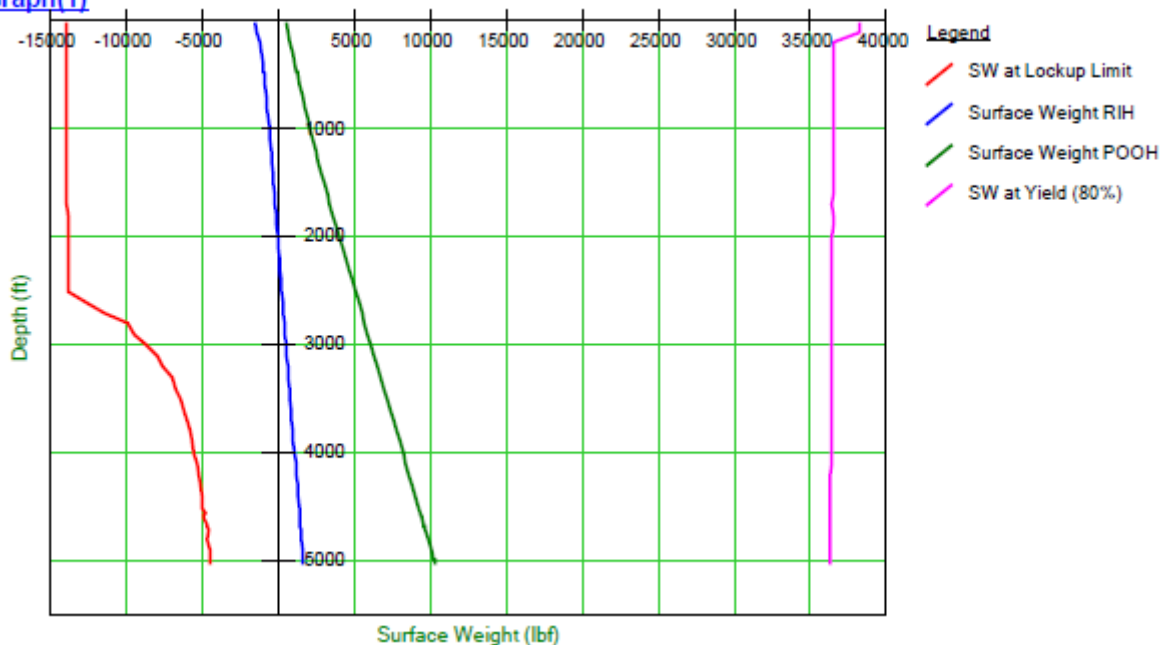
CT Limits



TFA – NITRIFIED CONDITION (RATE AS PER CIRCA)

TUBING FORCE ANALYSIS AT 1,533m / 5,030ft MDDF

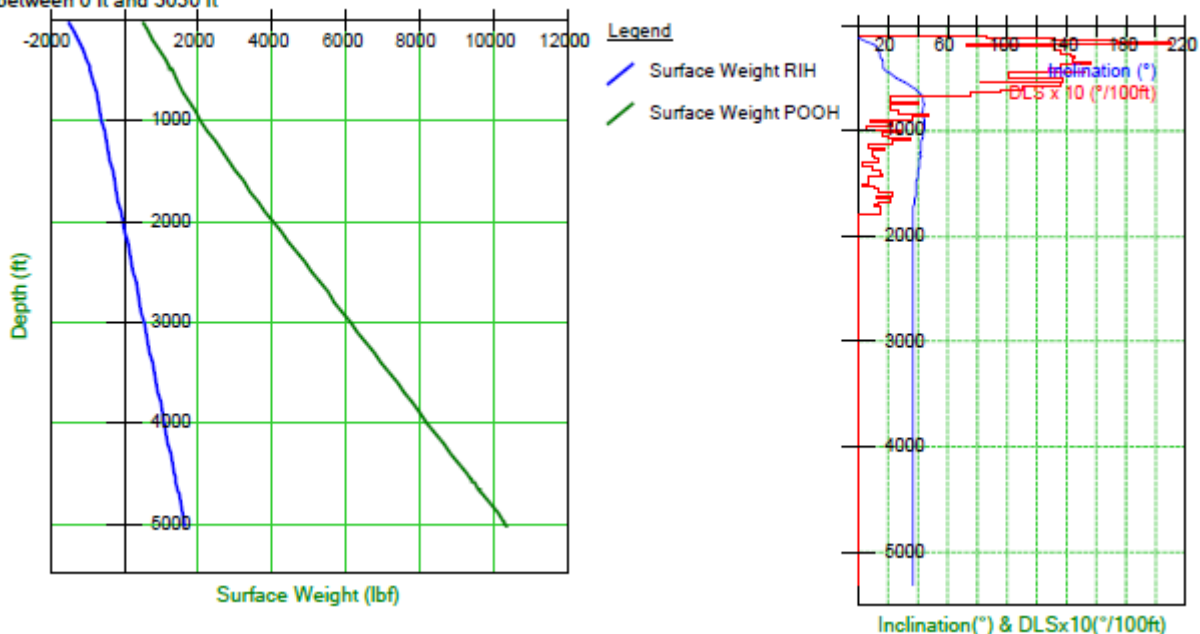
Graph(1)



RIH & POOH WEIGHT

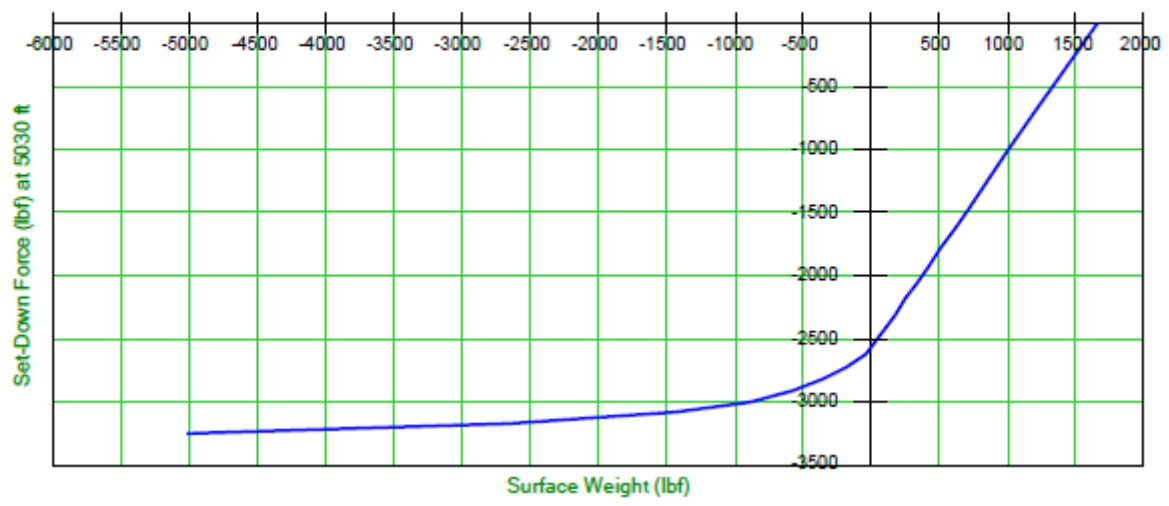
RIH and POOH

between 0 ft and 5030 ft



MAXIMUM STRING SET DOWN LIMIT

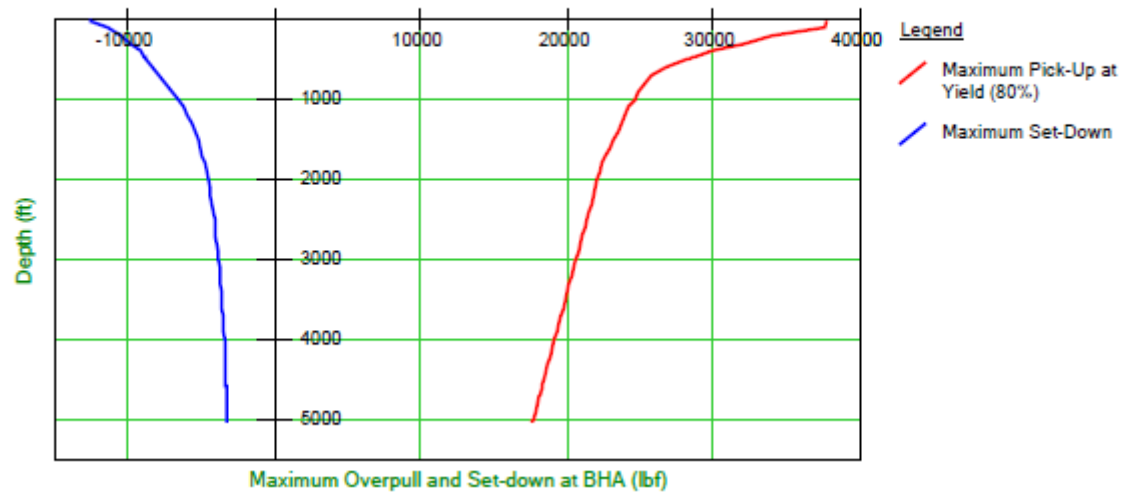
MD3 ■ The available set-down force at 5030 ft is -3254 lbf at the end of the string.
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MAXIMUM STRING PICK UP LIMIT

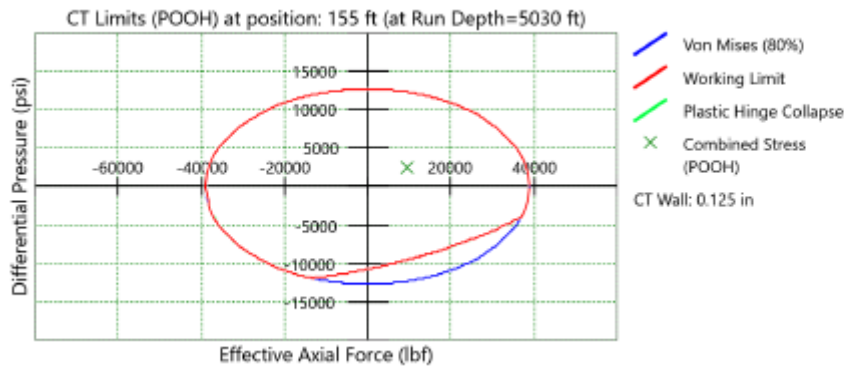
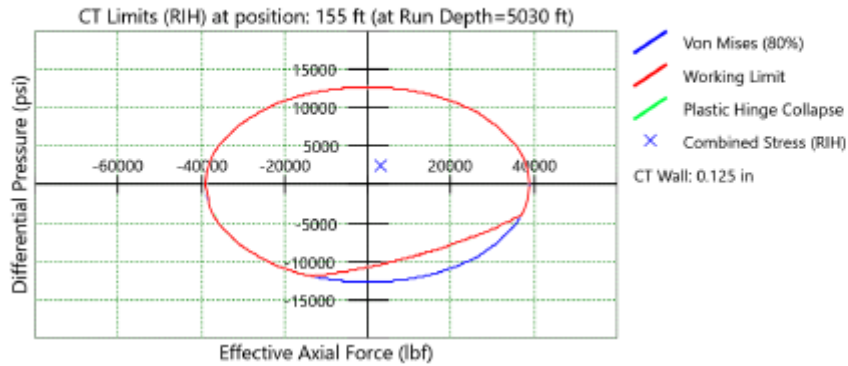
Calculations at 5030 ft


MD1 ■ The available pick-up at 5030 ft based on 80% of yield strength is 17627 lbf.
The weight indicator reading will then be 36302 lbf.



STRING LIMIT

CT Limits



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APPENDIX III – TOOL SPECIFICATION

Hydraulic Jar

Tool Size (in)	1.688	2.125	2.875
End Connection	1" AMMT	1 - 1/2" AMMT	2 - 3/8" PAC
ID (in)	0.56	0.75	1.00
Length Closed (ft)	5.75	5.58	7.00
Max Jarring Overpull (lbs)	10,000	18,000	32,000
Max Push (lbs)	10,000	18,000	32,000
Tensile Strength (lbs)	50,000	95,000	195,000

The equipment specifications and information advised in this document are for information only and may be liable to change without notice. Additional tool sizes and connection variations are available upon request.

Accelerator

Tool Size (in)	1.688	2.125	2.875
End Connection	1" AMMT	1 - 1/2" AMMT	2 - 3/8" PAC
ID (in)	0.56	0.75	1.00
Length Neutral (ft)	6.33	7.25	8.67
Tensile Strength (lbs)	50,000	95,000	195,000
Max Temperature (F)	400	400	400

The equipment specifications and information advised in this document are for information only and may be liable to change without notice. Additional tool sizes and connection variations are available upon request.

JDC FR

Tool Size (in)	1.812	2.625	3.000	3.625
To suit F/N size	1" to 1.375"	1" to 1.750"	1" to 2.313"	1" to 3.125"
Tensile Strength (lbs)	33,000	110,000	76,000	70,000
Length (ft)	0.98	1.40	1.35	1.60
Working Pressure (psi)	5,000	5,000	5,000	5,000

BDS FR

Tool Size (in)	2	2.875	3.625	4.00
End Connection	1-1/2" AMMT	2-3/8" PAC	2-3/8" PAC	2-3/8" PAC
Tensile Strength (lbs)	25,000	43,000	136,000	180,000
Length (ft)	1.36	1.59	2.00	2.05
Working Pressure (psi)	5,000	5,000	5,000	5,000