Ask Echometer Online Seminar – June 3, 2020

Introduction to Plunger Lift

TOTAL ASSET MONITOR (TAM)

http://www.echometer.com/Software/Total-Asset-Monitor

"Optimizing Plunger Lifted Wells by Acoustically Tracing the Plunger Fall", Rowlan, McCoy, Podio, Hein, SWPSC 2001

"Plunger Lift Analysis, Troubleshooting, and Optimization", Rowlan, McCoy, Podio, Canadian Petroleum Society 2007-159

"Modified Foss and Gaul Model Accurately Predicts Plunger Rise Velocity", Rowlan, Lea, McCoy, SPE120636, 2009

"Measured Plunger Fall Velocity Used to Calibrate New Fall Velocity Model", Rowlan, McCoy, Lea, Nadkrynechny, Cepuch SPE164495

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Plunger Lift Deliquification of Gas Wells

Plunger Lift is a very economical Artificial Lift Method:

- Low initial investment
- Low recurring/maintenance cost
- Rig not required for installation
- Plunger lift costs do not increase with well depth

Uses well's pressure (Energy) to remove liquid loading

- Requires no outside energy source, if gas rate sufficient
- During Shut-in Period pressure must buildup to required minimum

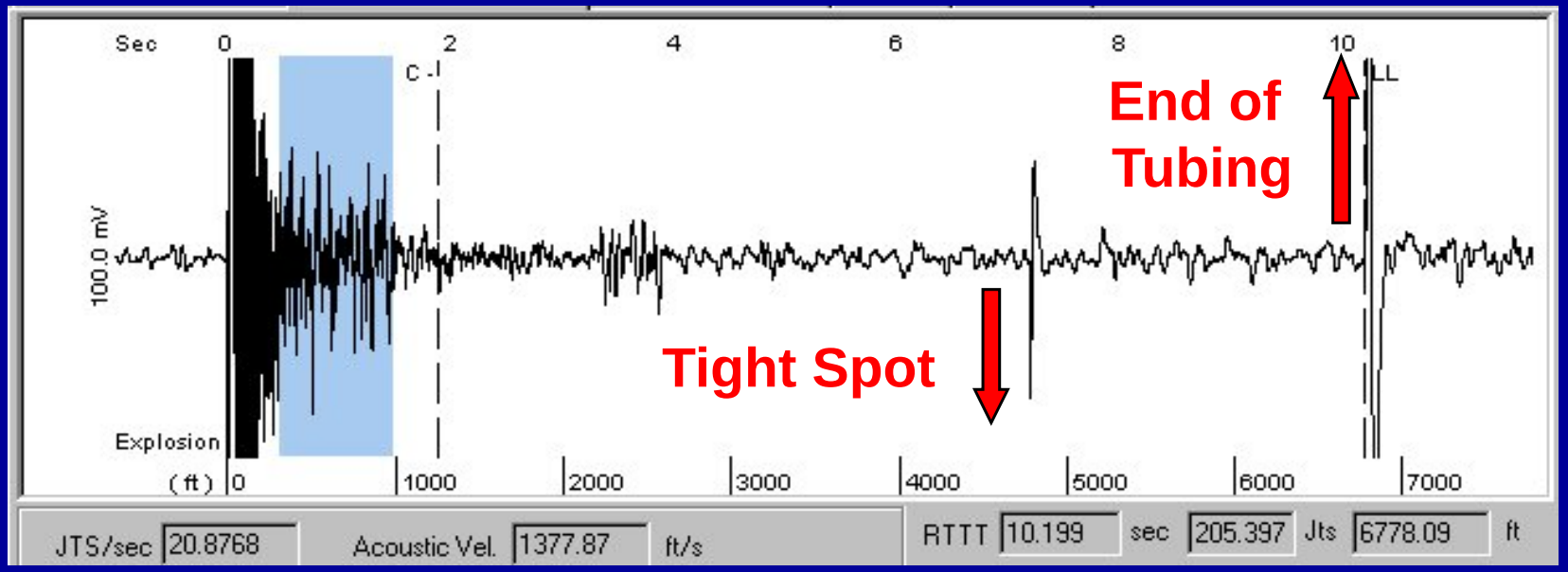
Plunger Application

- Primarily used for Dewatering gas wells
- Superior Method to handle gassy wells
- Keeps tubing cleaned of paraffin deposits

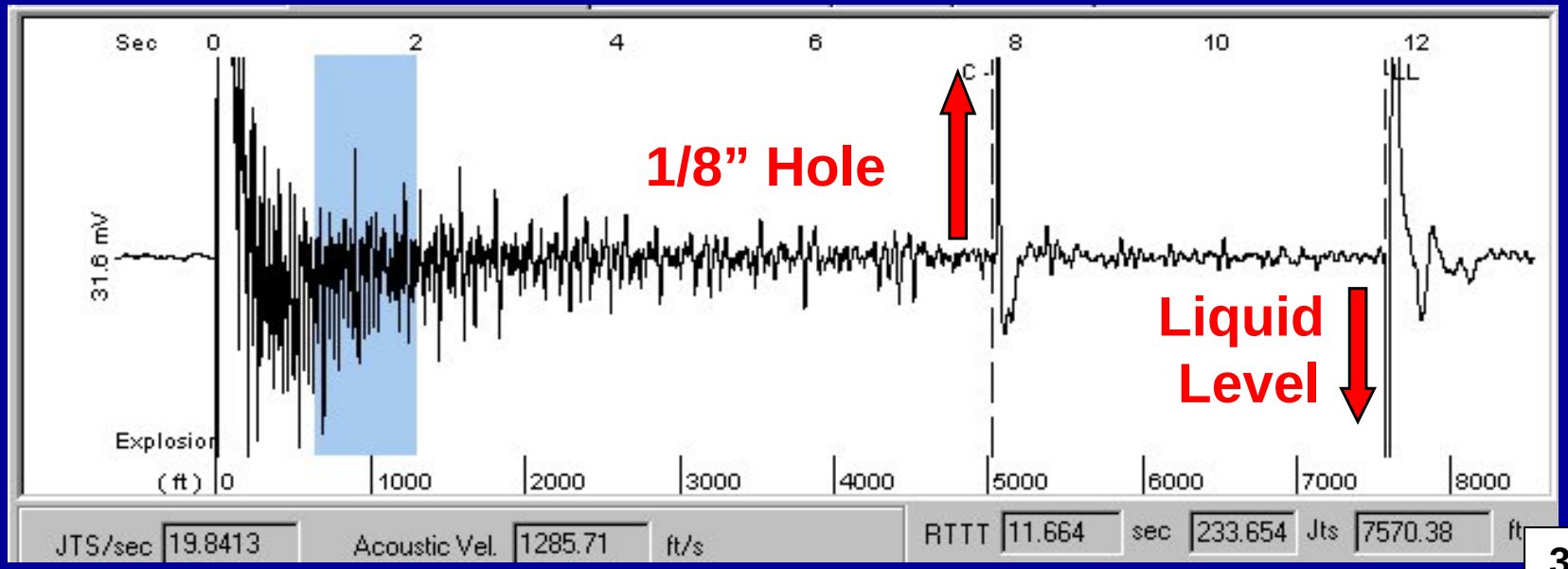
Plunger Lift can be used to produce well to depletion; but other methods such as casing plunger and beam lift can pull the well to lower pressures.

1st Step is to Shoot Fluid Levels to Alert You to What is Downhole

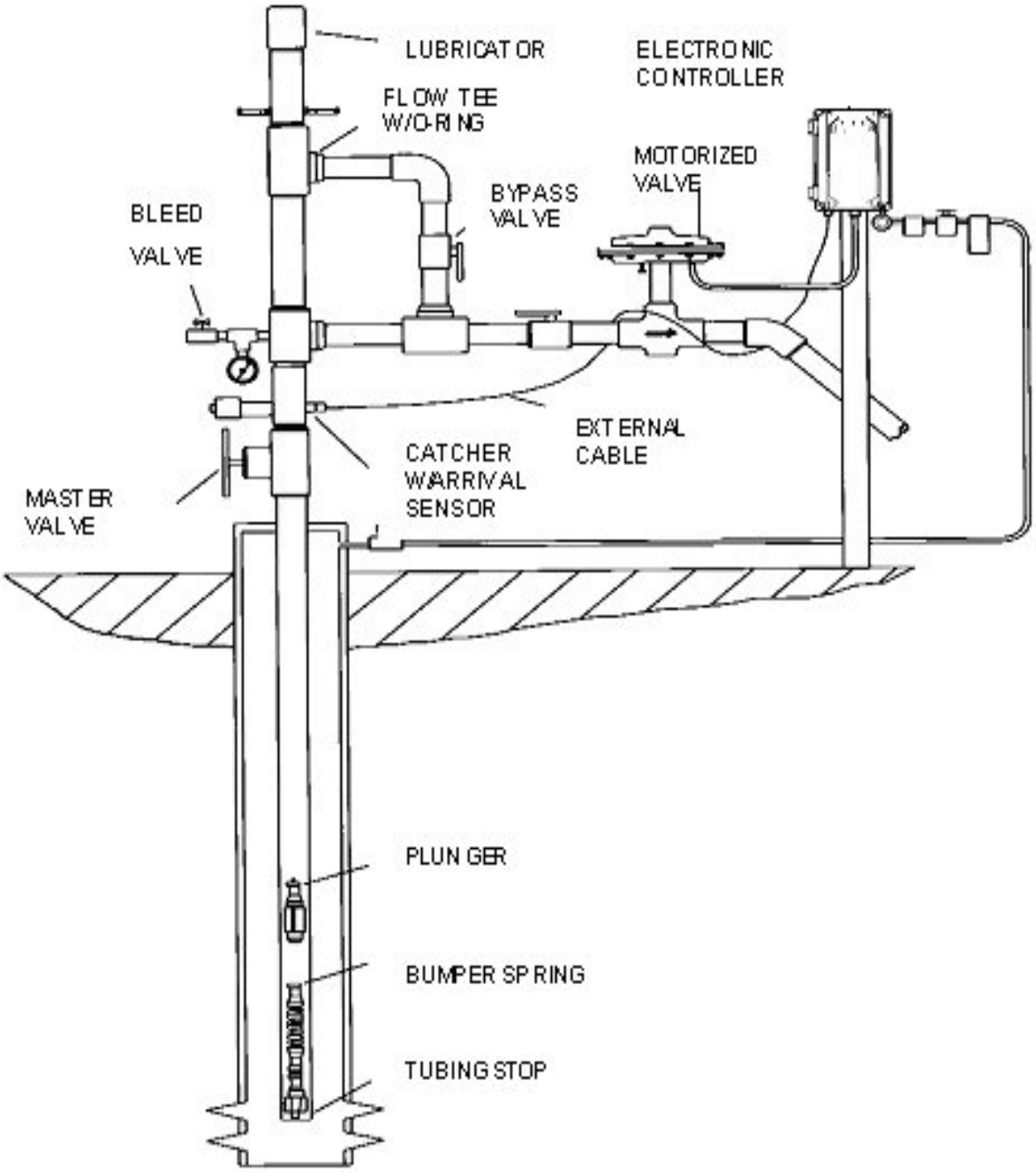
@ 4750’ Tight Spot in Tubing



@ 5050’ 1/8” Hole in Tubing



Major Plunger Lift Components



Controller: **Electronic-based system with control parameters to determine under what conditions to exert control by opening/closing the motor valve**

Transducer: **Electronic device that emits an electronic signal to be converted within controller to engineering units**

Motor Valve: **Diaphragm-operated device controlled by controller to open/close sales/tank line**

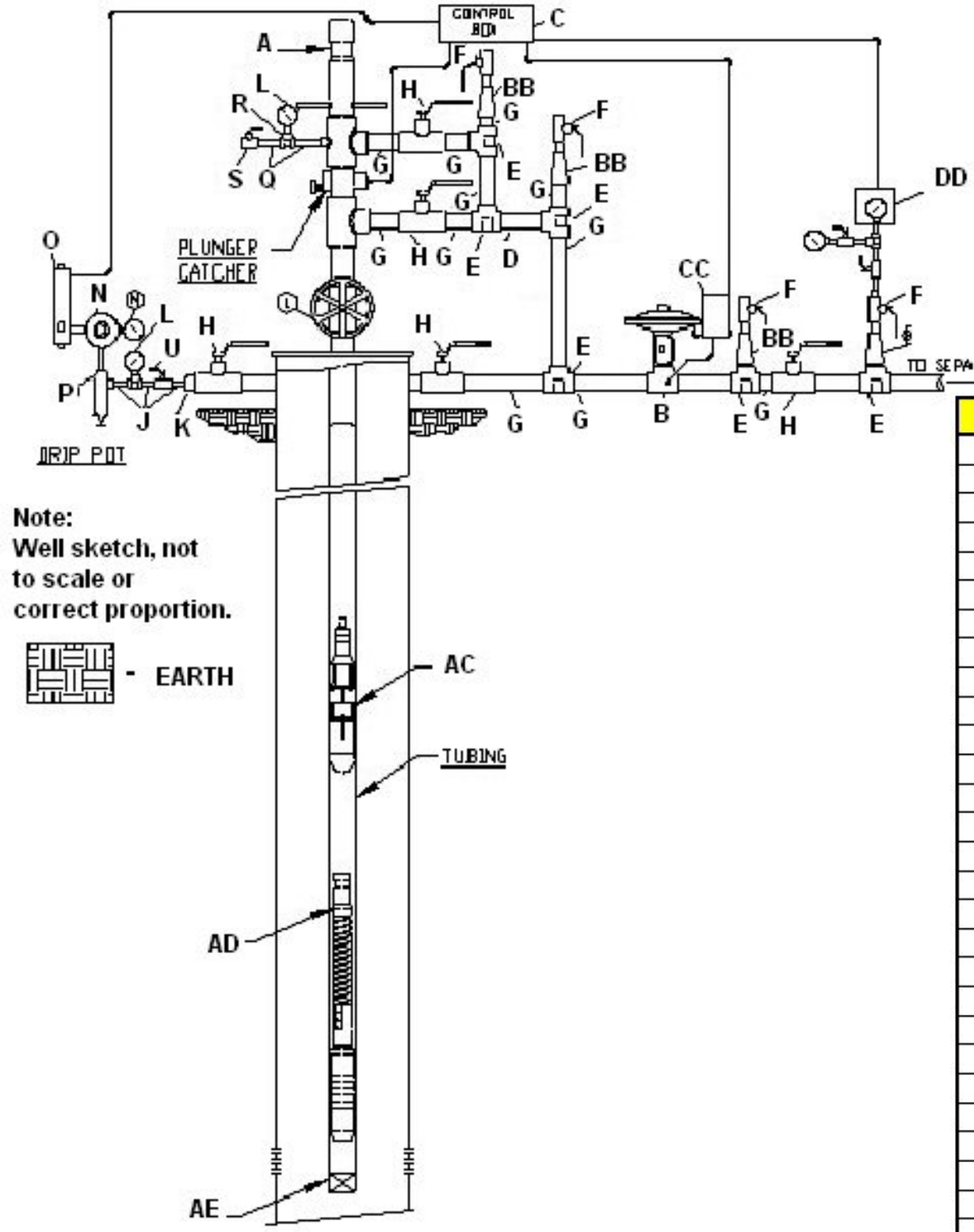
Lubricator/Catcher: **Uppermost stopping point for plunger; acts as shock absorber; catcher is mechanical device that locks plunger in lubricator for removal and for inspection**

Arrival Sensor: **Magnetic device strapped around lubricator to detect plunger arrivals… Vibration sensors have been used**

Bumper Spring: **Shock absorber at plunger's deepest stopping point**

Plunger: **Pig-type device that provides a seal between gas and liquid inside tubing to deliver fluid and gases to surface with differential pressure. The plunger travels entire length of tubing from catcher to bumper spring.**

Low Cost Plunger Well Parts List



Key	Item	Quantity
AC	plunger	1
AD	Bottom hole bumper spring assembly	1
AE	Seating nipple	1
BB	2" x 1" swedge	3
CC	Pressure control (fisher wizard?)	1
DD	Murphy Switch/High line delay	1
A	Lubricator/catcher assembly	1
B	Kimray Motor Valve	1
C	Auto-cycle controller	1
D	2" x 8" nipple	3
E	2" TEE	5
F	1" ball valve	3
G	2" x necessary length nipple	15
H	2" ball valve	5
I	flanged master valve	1
J	1/4" x 2" pipe nipple	3
K	2" bull plug with 1/2" tap	1
L	press. Gauge or gauge tap w/tee	1
M	press. Gauge or guage tap	1
N	Kimray (meco) 664s regulator	1
O	Fisher 51R Regulator	1
P	Drip pot	1
Q	1/2" x 2" pipe nipple	2
R	1/2" TEE	1
S	1/2" valve (fully opening)	1
T	1/2" pressure gauge or guage tap	1
U	1/4" valve	1
V	~15 feet: 1/4" SS Tubing & fittings	

New Technology for Analyzing Plunger Lift

Equipment on Well

PLUNGER LIFT SURVEY ANSWERS THE FOLLOWING WELL PERFORMANCE QUESTIONS:

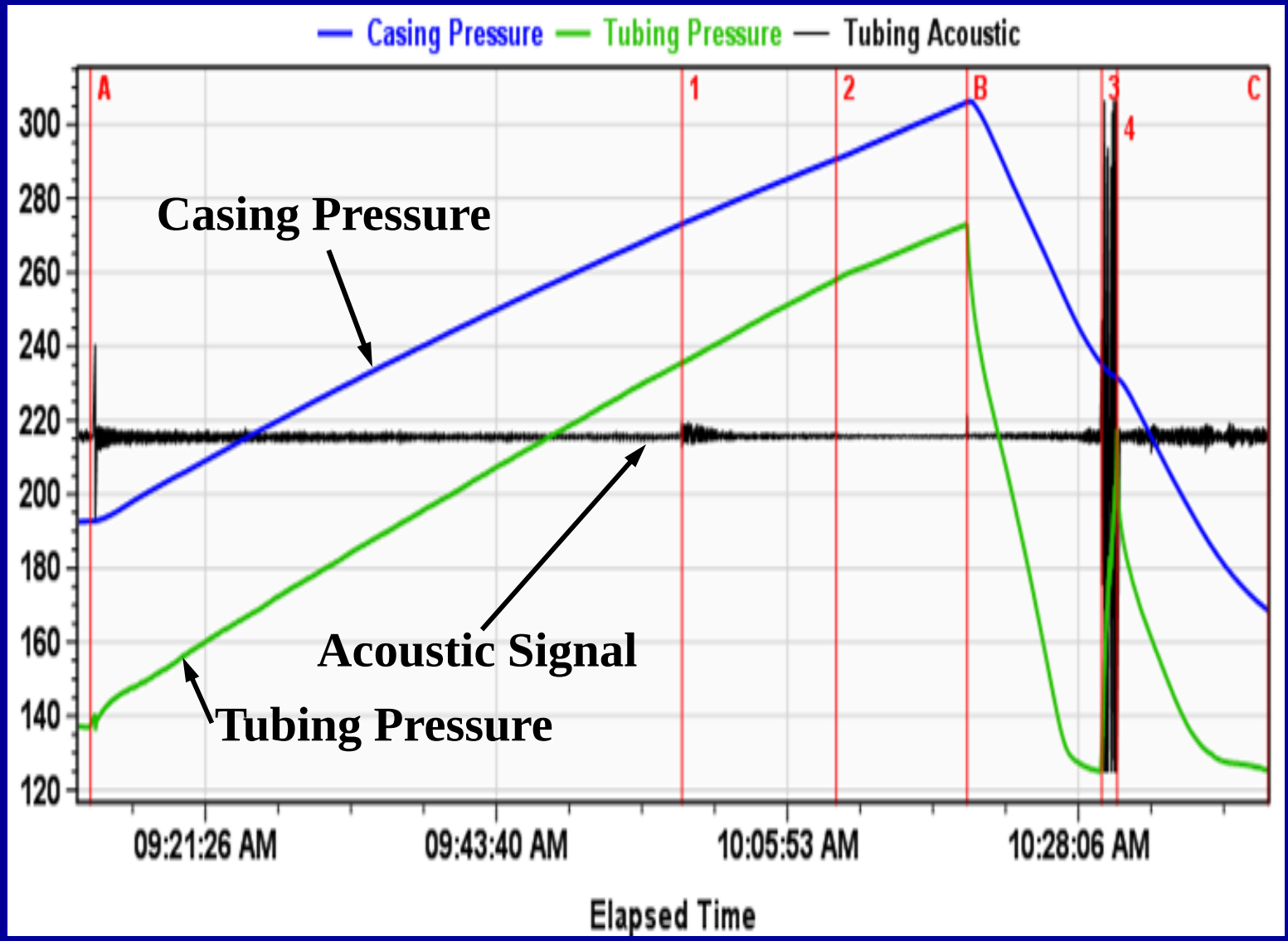
- Where is the plunger? Surface? In or above the liquid? On Bottom?
- What is the depth to the top of the liquid in the Tubing?
- What is the producing and Static BHP?
- Is liquid in the casing annulus above the tubing intake?
- What are the casing and tubing pressures during the operational cycle?
- Does tubing gas/liquid pressure push liquid out of tubing?
- What is the maximum production rate available from the well?
- What is the gas flow rate? From Formation? Annulus? Flowline?
- What is the gas gravity?
- Are there restrictions to plunger fall in the tubing?

PLUNGER OPERATION CYCLE

Record High Speed Acoustic, Tubing & Casing Pressure

[A] 1 2 [B] 34 [C]

- **[A]** Valve Closes, Shut-in Begins and Tubing Pressure Starts Increasing
- **1.** Plunger hits Liquid
- **2.** Plunger on Bottom
- **[B]** Valve Opens, Unloading Begins
- **3.** Liquid Arrives, Tubing Pressure at Minimum
- **4.** Plunger Arrives, After-flow begins Tubing Pressure Maximum Spike
- **[C]** Valve Closes, Cycle Repeats



What does a Plunger Controller Control?

1. **Off Time (Length of Shut-in)**
   - Elapsed time valve is closed (No Sales)
   - Maximum allowed time, or required casing pressure build up

2. **On Time (Length of Flow)**
   - Elapsed time valve is open (Gas sold)
   - Liquid is Unloaded from well
   - Gas is produced and well loads up with next liquid slug

Plunger Controller acts as an on/off switch for Control Motor Valve.

Control Options:

Elapsed Time, Pressure Differential, Pressure Set Point, Load Factor, Flow Rate, Plunger Speed And/OR Foss and Gaul

- **Manual On/Off Timer**
  - Controls based on preset times to close or open valve
  - Set times are usually conservative
  - Controller doesn't automatically adjust as well conditions change
  - Operator makes adjustment to adjust on and off times
- **Automated On/Off based on Plunger Speed**
  - Easiest to use in wells with packers
  - Makes automatic adjustments based on plunger arrival time
  - Can make proportional adjustments
  - Less time consuming for operators
- **Combination Automated On/Off plus Pressure Monitoring**
  - Monitors flow rates, pressure differential, and plunger speed
  - Afterflow determined by comparing current flow rate to critical rate
  - Shut in time determined by monitoring casing, tubing, or line and when pressures sufficient, based on calculations, well is allowed to open

Controller should help maximize production.

Conventional Plunger Cycle

Plunger lift operation cycle can be divided into three parts:

1) **Shut-in:** Surface valve closed, flow shut-in, plunger falls down the tubing. Goal of the operator or controller is to try to achieve Shut-in of the well for the shortest amount of time possible, But long enough for plunger to reach bottom. And long enough for the pressure to build high enough to bring the plunger back to surface.

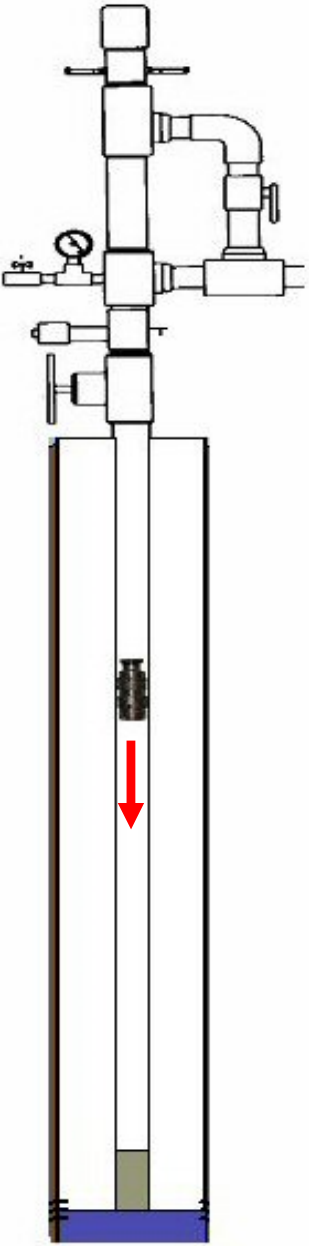
2) **Unloading:** Surface valve open and pressure stored in the casing lifts the accumulated liquid and plunger to the surface

3) **After-flow:** Surface valve open and well continues to flow after plunger reaches the surface. Plunger held at surface by differential pressure from flow of gas up the tubing. Well is producing gas. Most liquid produced from the formation tends to fall back, accumulating at the bottom of the tubing. The goal of the operator or controller is to Flow the well only until the well begins to load with liquids.

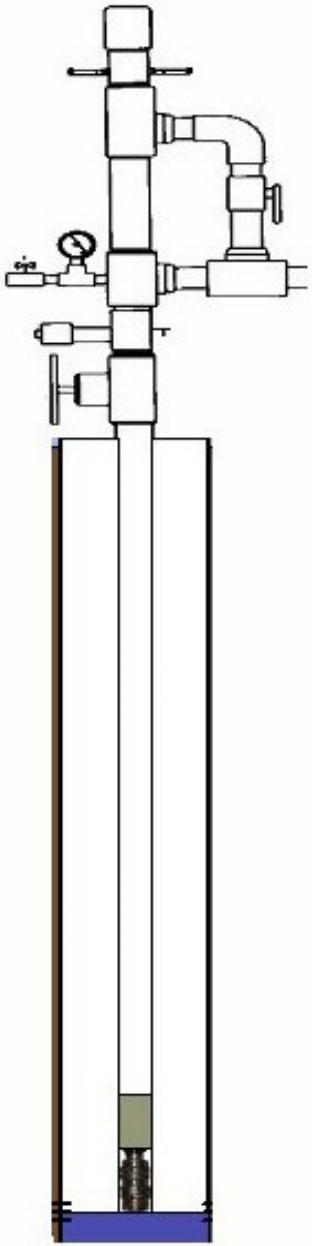
Thanks: Dan Phillips and Scott Listiak

How Does Conventional Plunger Lift Work

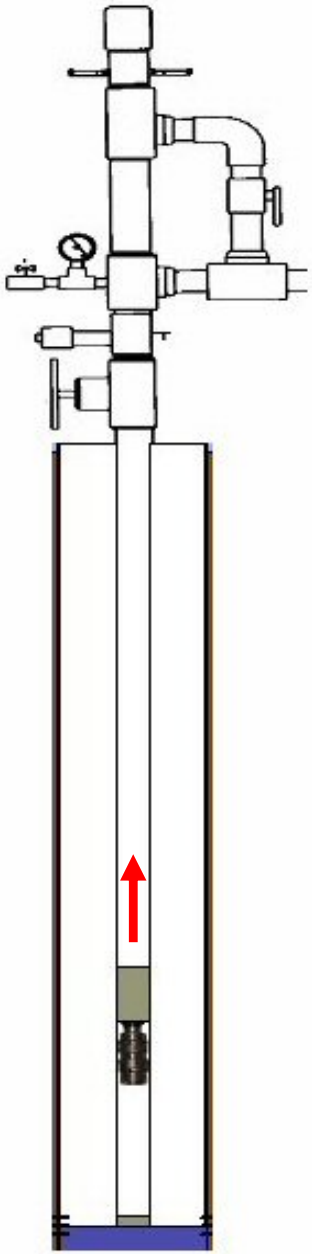
[A] Valve Closes, Shut-in Begins and Pressure Starts Increasing



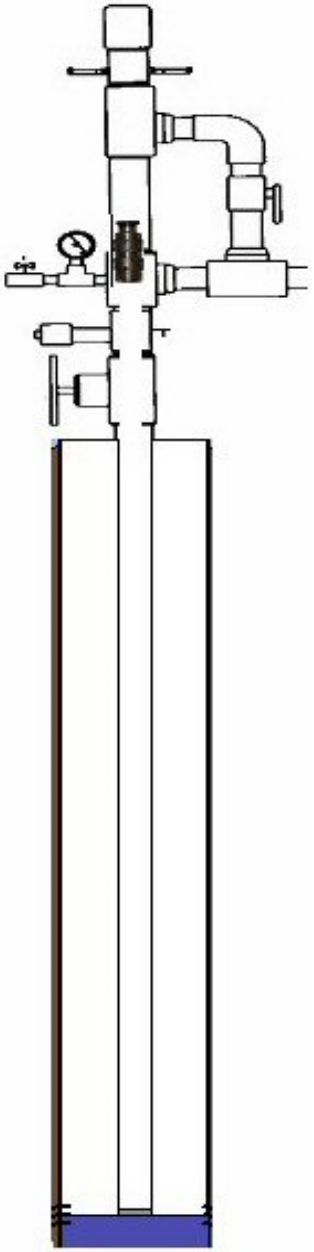
[2] Shut-in Valve Closed, w/ Pressure Increasing



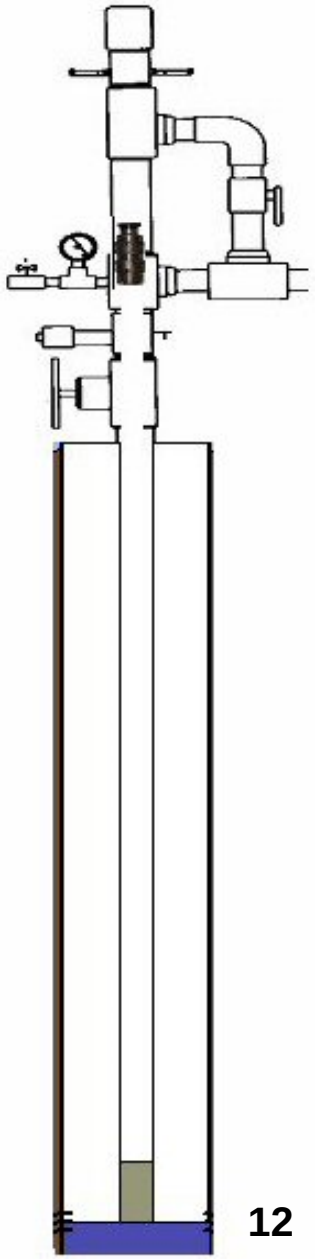
[B] Valve Opens, Unloading Begins



[4] Plunger Arrives, Tubing Pressure Spike Maximum, After-flow begins



[C] Valve Closes, Cycle Repeats



Pressures During Normal Well Cycle

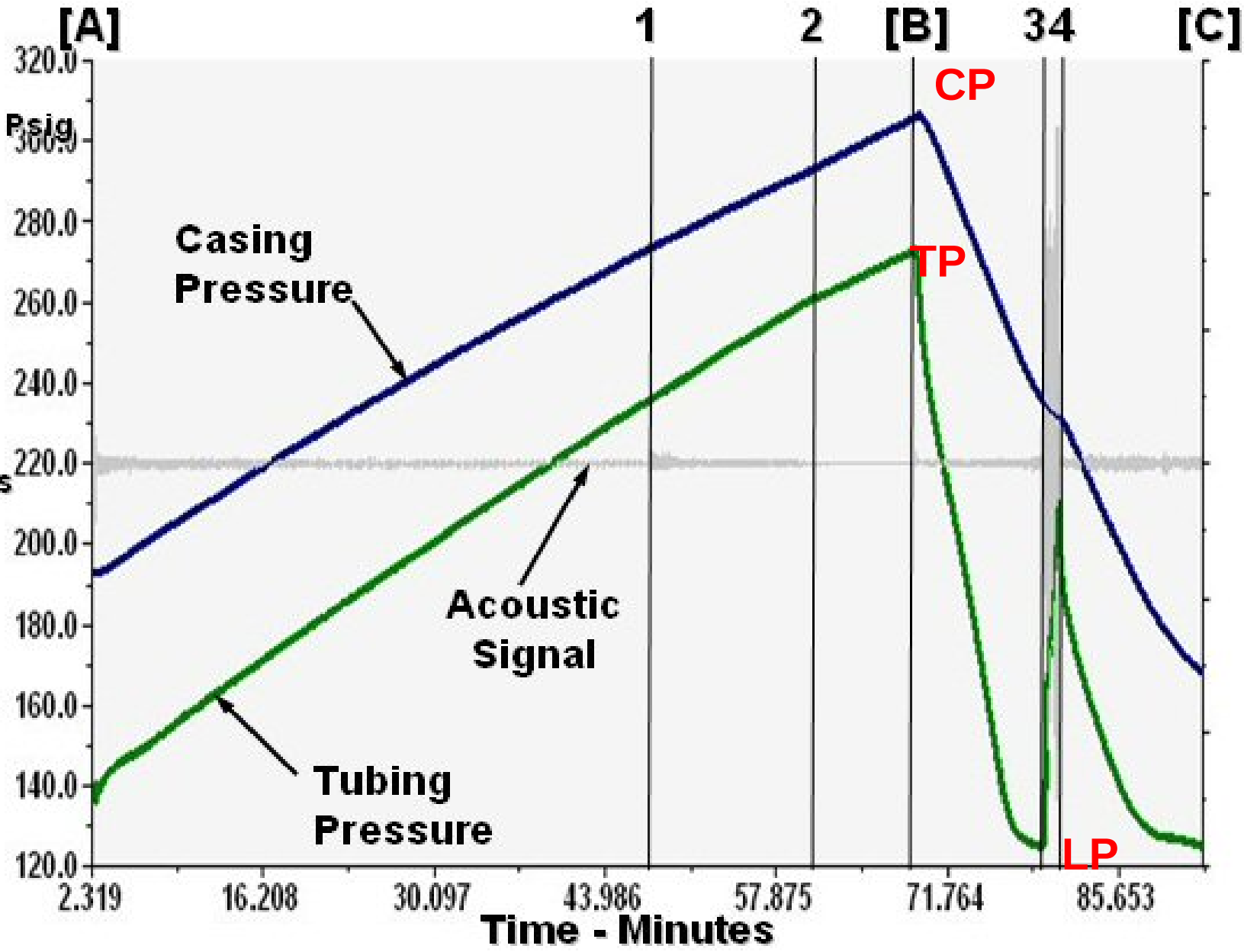
[A] Valve Closes, Shut-in Begins and Tubing Pressure Starts Increasing

1. Plunger hits Liquid
2. Plunger on Bottom

[B] Valve Opens, Unloading Begins

3. Liquid Arrives, Tubing Pressure at Minimum
4. Plunger Arrives, After-flow begins Tubing Pressure Maximum Spike

[C] Valve Closes, Cycle Repeats



Conventional Plunger Cycle

[A] – [B] ~ Shut-in

- Surface valve closes to Shut-in well, when afterflow time period ends or control parameters are met; controller is in off cycle and plunger falls to bumper spring at bottom of well.
- CP pressure builds during fall and build-up period (if needed)

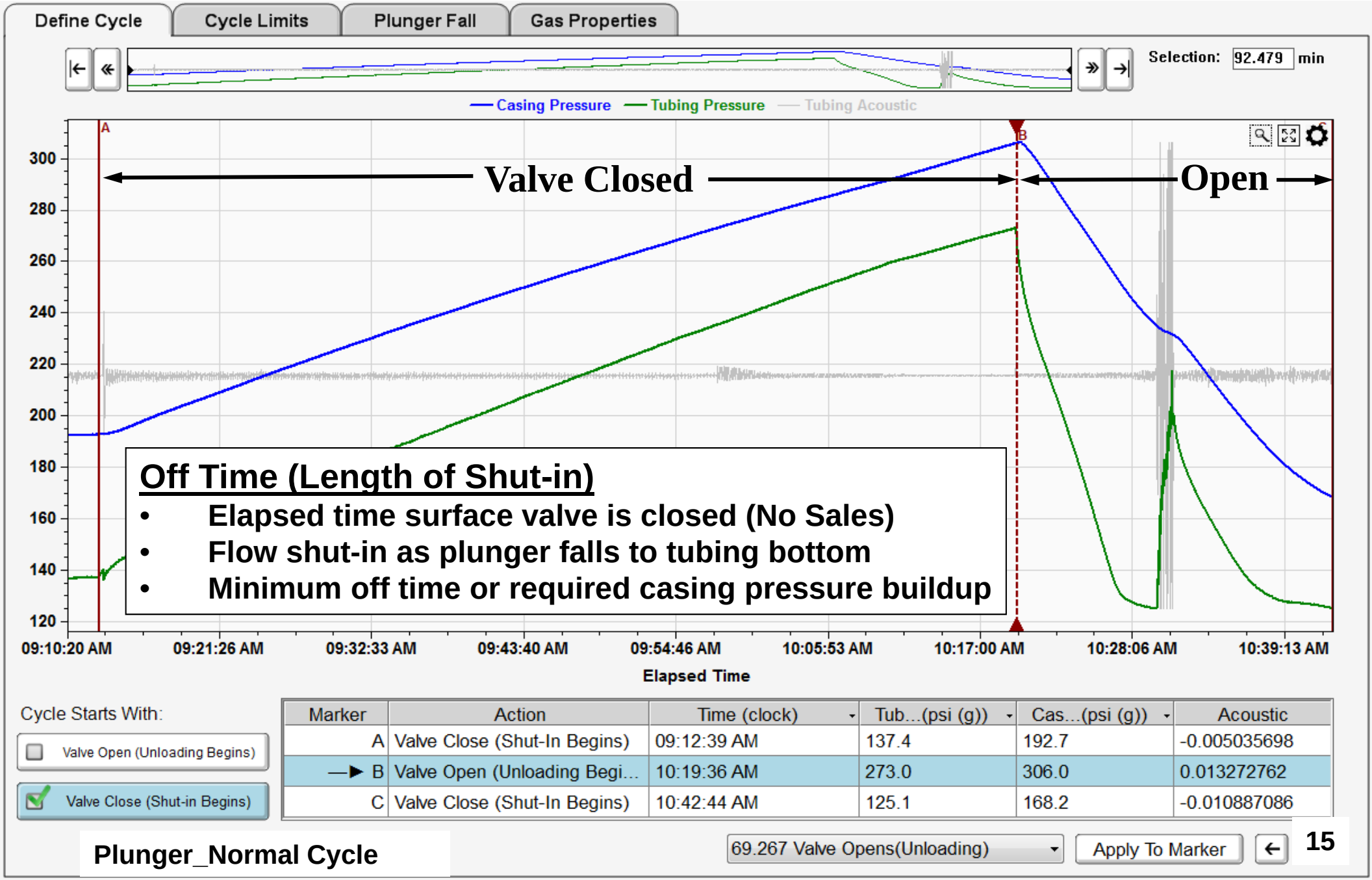
[B] – 4 ~ Unloading

- When surface control parameters are met controller enters on cycle opens valve and exhausts [tubing pressure] TP → LP [line pressure] to create differential pressure across plunger
- Plunger acts as interface between liquid slug CP-TP and higher pressure gas below that drives plunger upward
- CP-LP pressure then lifts liquids and plunger to surface.

4 – [C] ~ Afterflow

- Sensors record plunger's arrival and afterflow time period starts.
- When afterflow time period ends or control parameters are met; controller returns to off cycle. Back to Shut-in Step (above)).

Plunger Controller acts as an on/off switch to Control Motor Valve.

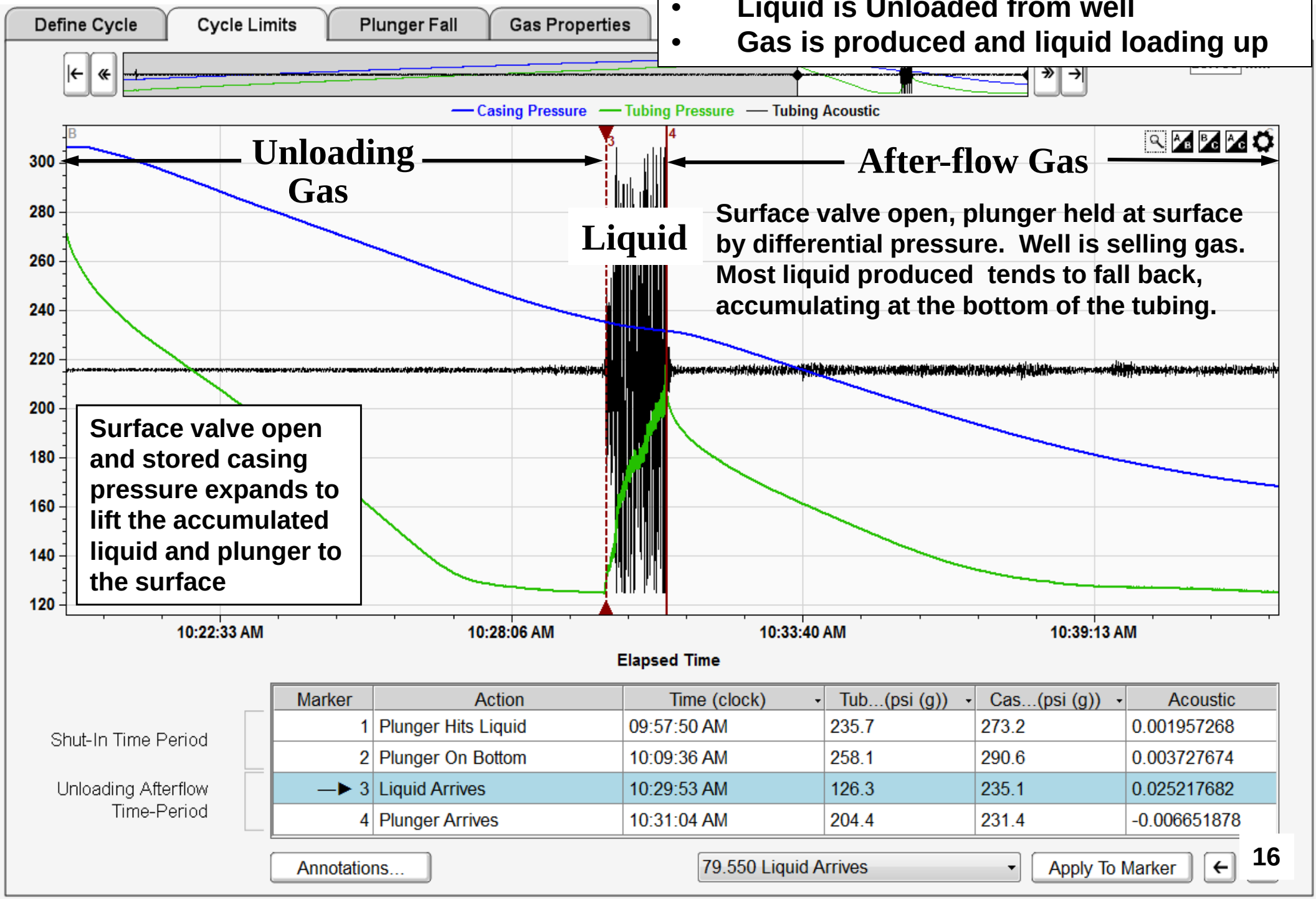


Plunger_Normal Cycle

Unloading and After-flow

On Time (Length of Flow)

- Elapsed time valve is open (Gas sold)
- Liquid is Unloaded from well
- Gas is produced and liquid loading up



Marker	Action	Time (clock)	Tub...(psi (g))	Cas...(psi (g))	Acoustic
1	Plunger Hits Liquid	09:57:50 AM	235.7	273.2	0.001957268
2	Plunger On Bottom	10:09:36 AM	258.1	290.6	0.003727674
▶ 3	Liquid Arrives	10:29:53 AM	126.3	235.1	0.025217682
4	Plunger Arrives	10:31:04 AM	204.4	231.4	-0.006651878

Shut-In Time Period

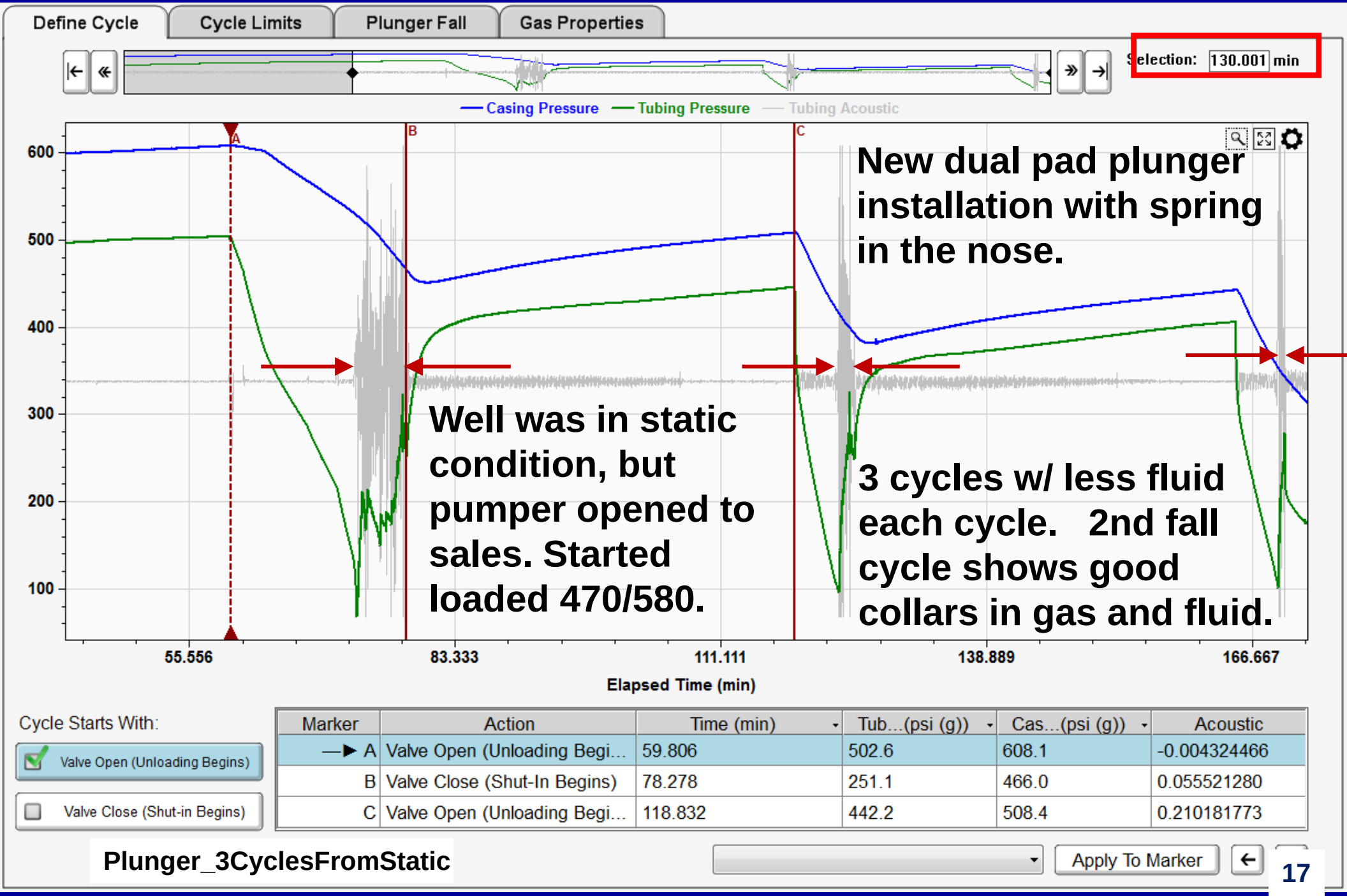
Unloading Afterflow Time-Period

Annotations...

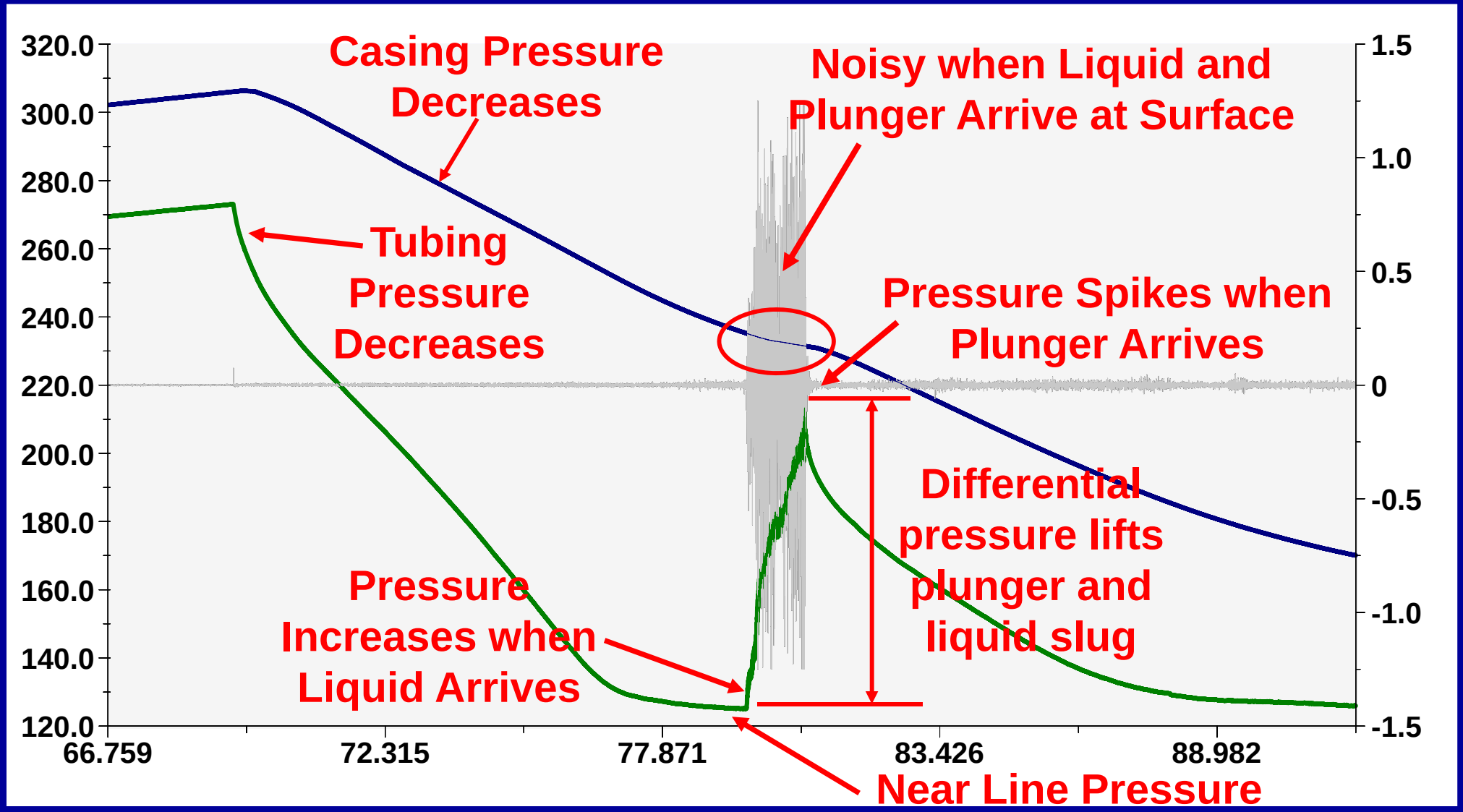
79.550 Liquid Arrives

Apply To Marker

Liquid Arrives During Unloading



Unloading begins when Controller opens motor valve between tubing and flow line.



Plunger_Normal Cycle

Operational Benefits of Plunger Tracking

1. Plunger lift program takes the guess work out of setting fall times.

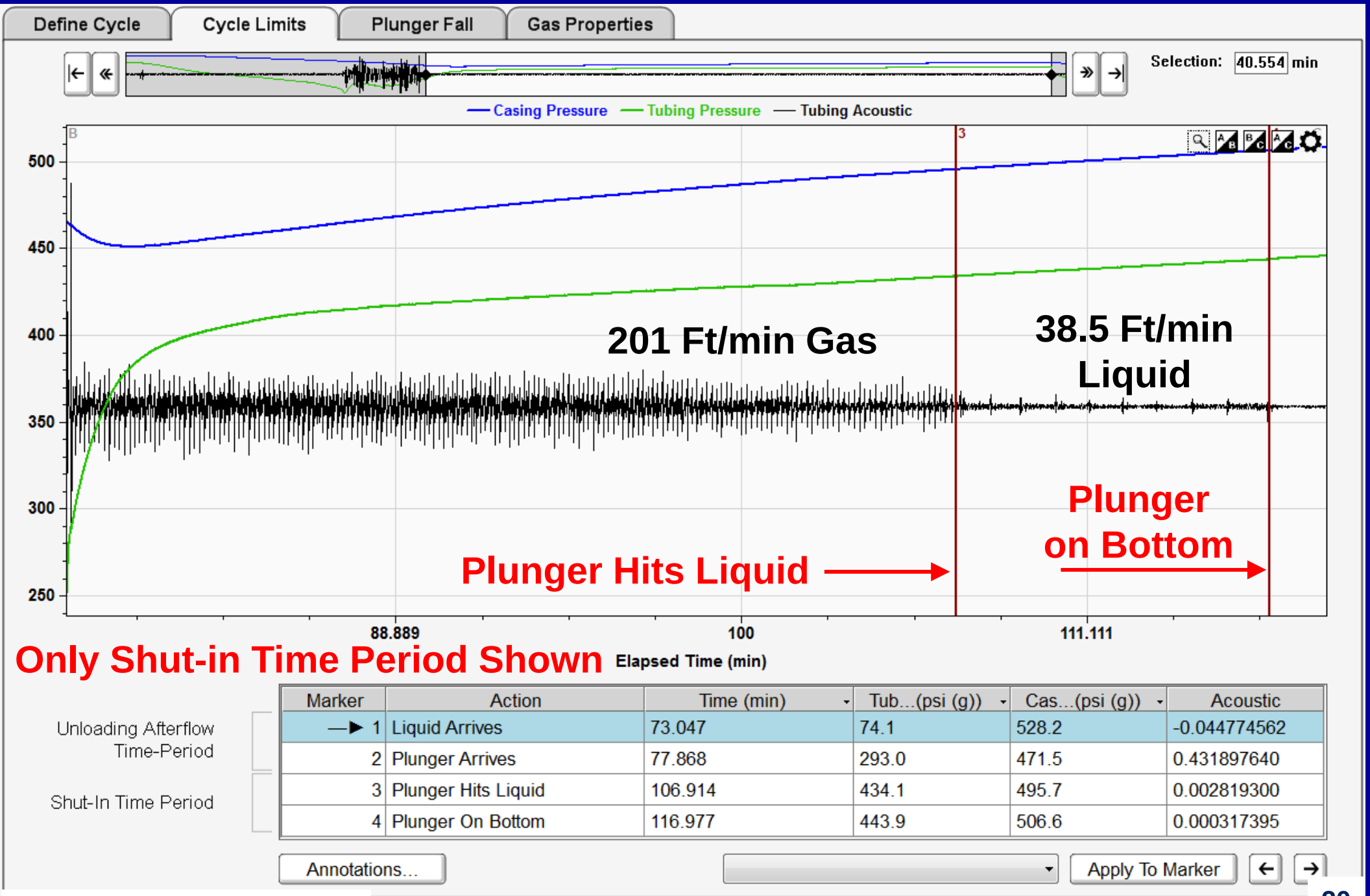
2. Accurate fall time measured from the time the plunger begins fall to the time the plunger hits the seat nipple or bottom hole spring.

3. Increased gas production with less shut-in time.

4. After-flow can be set by monitoring pressure to determine when casing pressure starts to rise then well loading begins. Use Foss & Gaul!

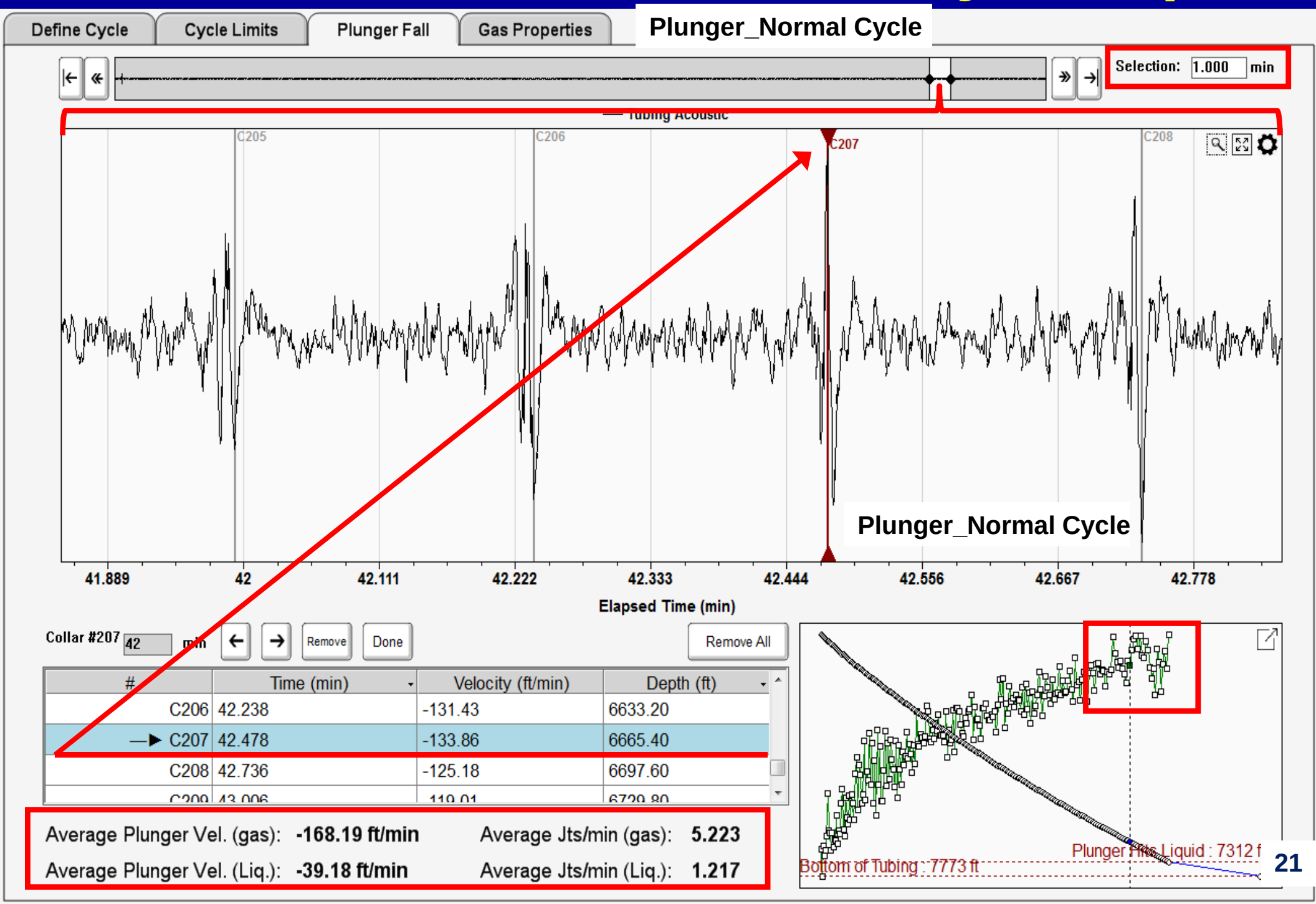
5. Save time by ensuring all plunger runs are made and maximize sales time.

Take Guess Work Out of Setting Shut-in Time



Marker	Action	Time (min)	Tub...(psi (g))	Cas...(psi (g))	Acoustic
1	Liquid Arrives	73.047	74.1	528.2	-0.044774562
2	Plunger Arrives	77.868	293.0	471.5	0.431897640
3	Plunger Hits Liquid	106.914	434.1	495.7	0.002819300
4	Plunger On Bottom	116.977	443.9	506.6	0.000317395

Count Collars for Fall Velocity & Depth



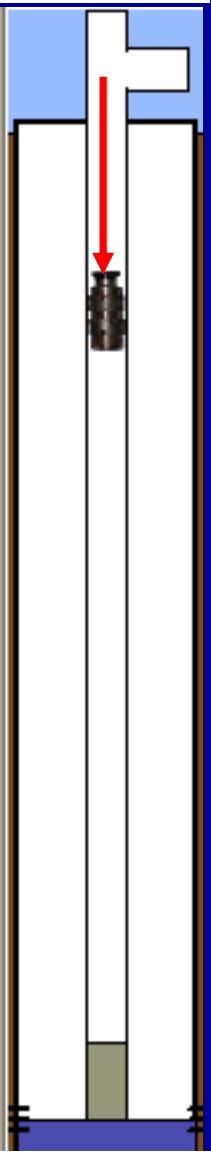
Velocity: Plunger Fall Speed Between Two Consecutive Counted Collars

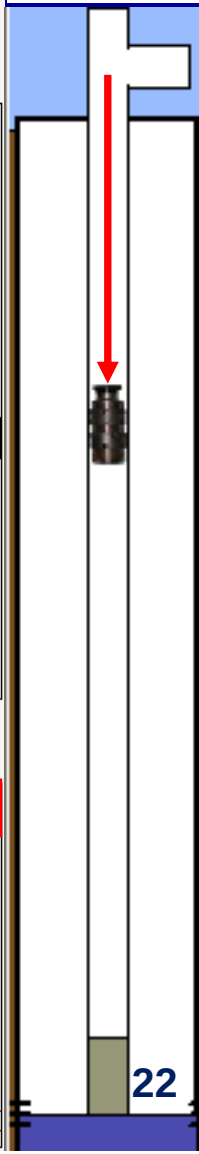
Plunger Velocity @ Joint 22 equals the change in depth divided by the change in elapsed time.

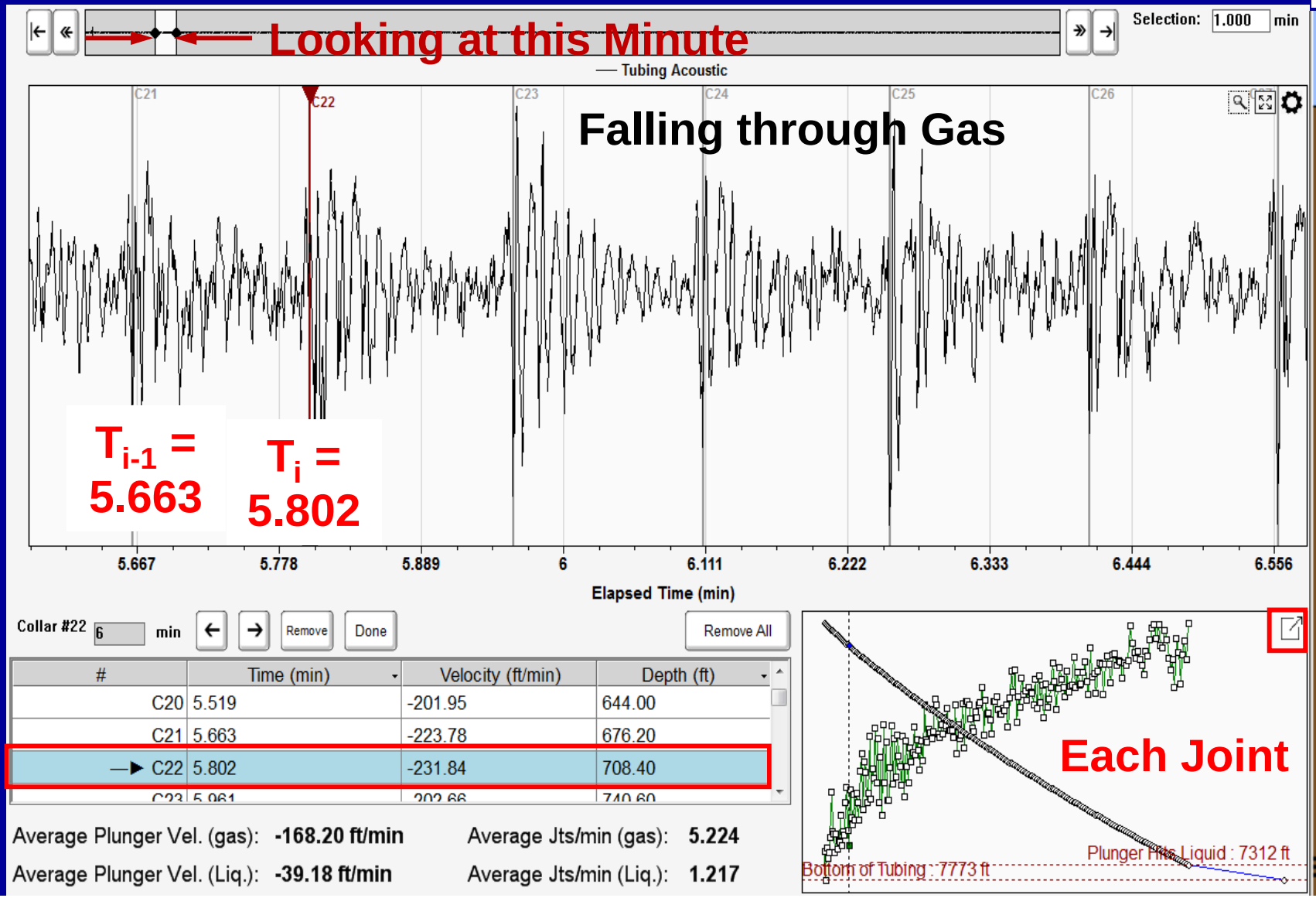
Velocity = $(D_i - D_{i-1}) / (T_i - T_{i-1})$ = -231.8 ft/min

D_{i-1} = 676.2

D_i = 708.4



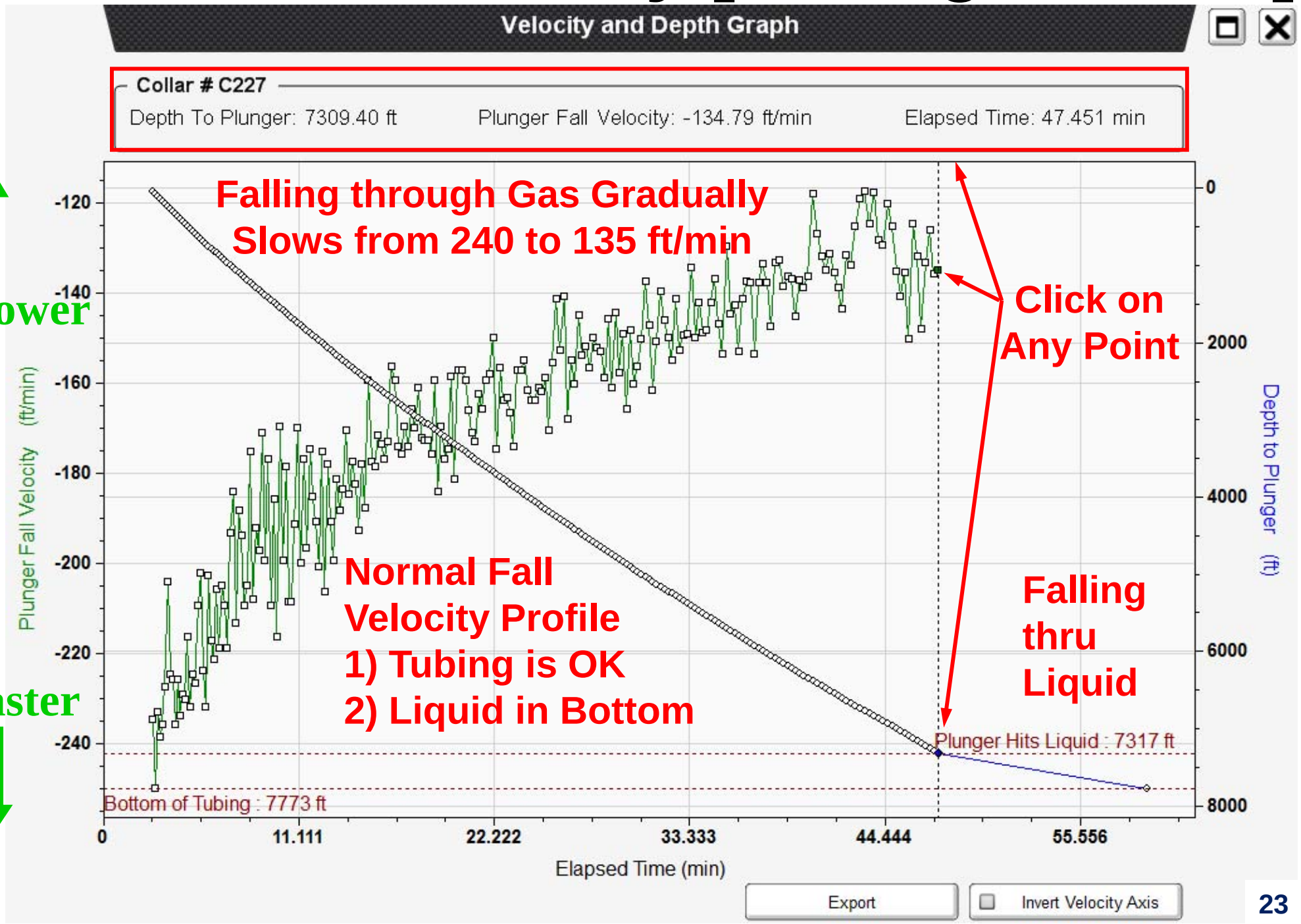




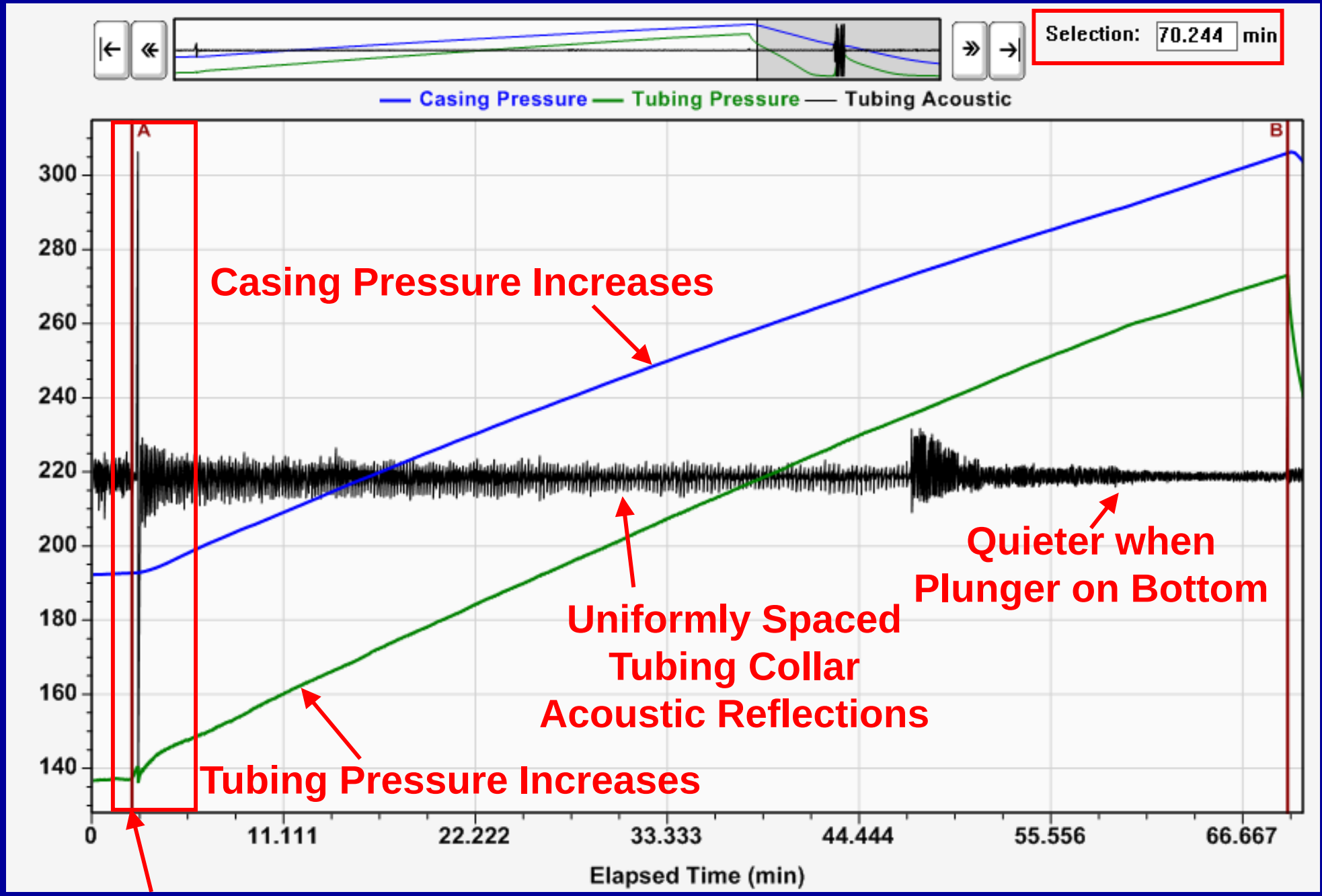
#	Time (min)	Velocity (ft/min)	Depth (ft)
C20	5.519	-201.95	644.00
C21	5.663	-223.78	676.20
▶ C22	5.802	-231.84	708.40
C23	5.961	202.66	740.60

Average Plunger Vel. (gas): **-168.20 ft/min**
Average Plunger Vel. (Liq.): **-39.18 ft/min**
Average Jts/min (gas): **5.224**
Average Jts/min (Liq.): **1.217**

Normal Fall Velocity [During Shut-in]

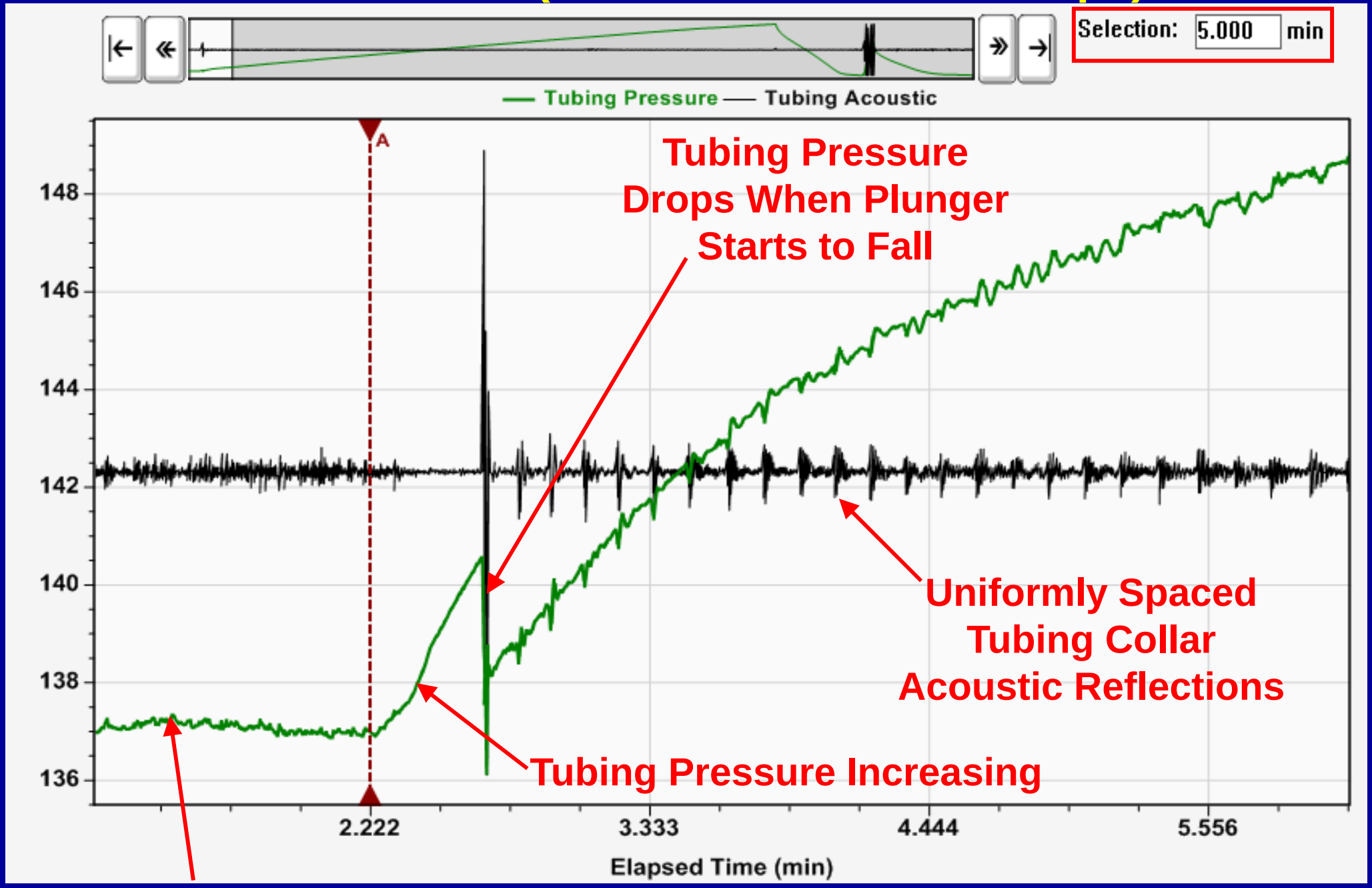


Shut-in Begins When the Flow Line Motor Valve Closes (Flow down flow line stops)



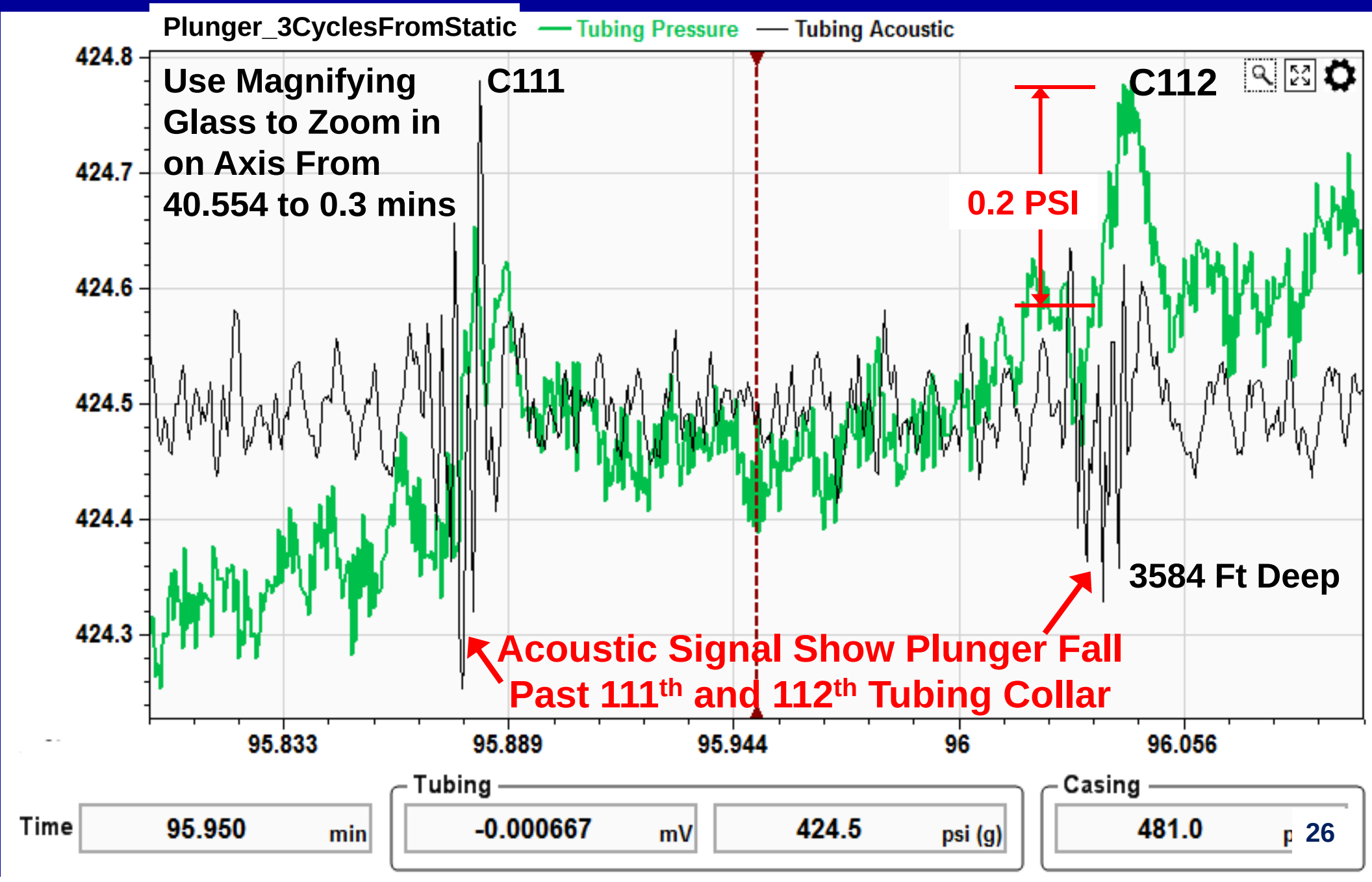
Zoom in to 5 minute X-axis Range to see Details

Shut-in Begins When the Flow Line Motor Valve Closes (Flow down flow line stops)

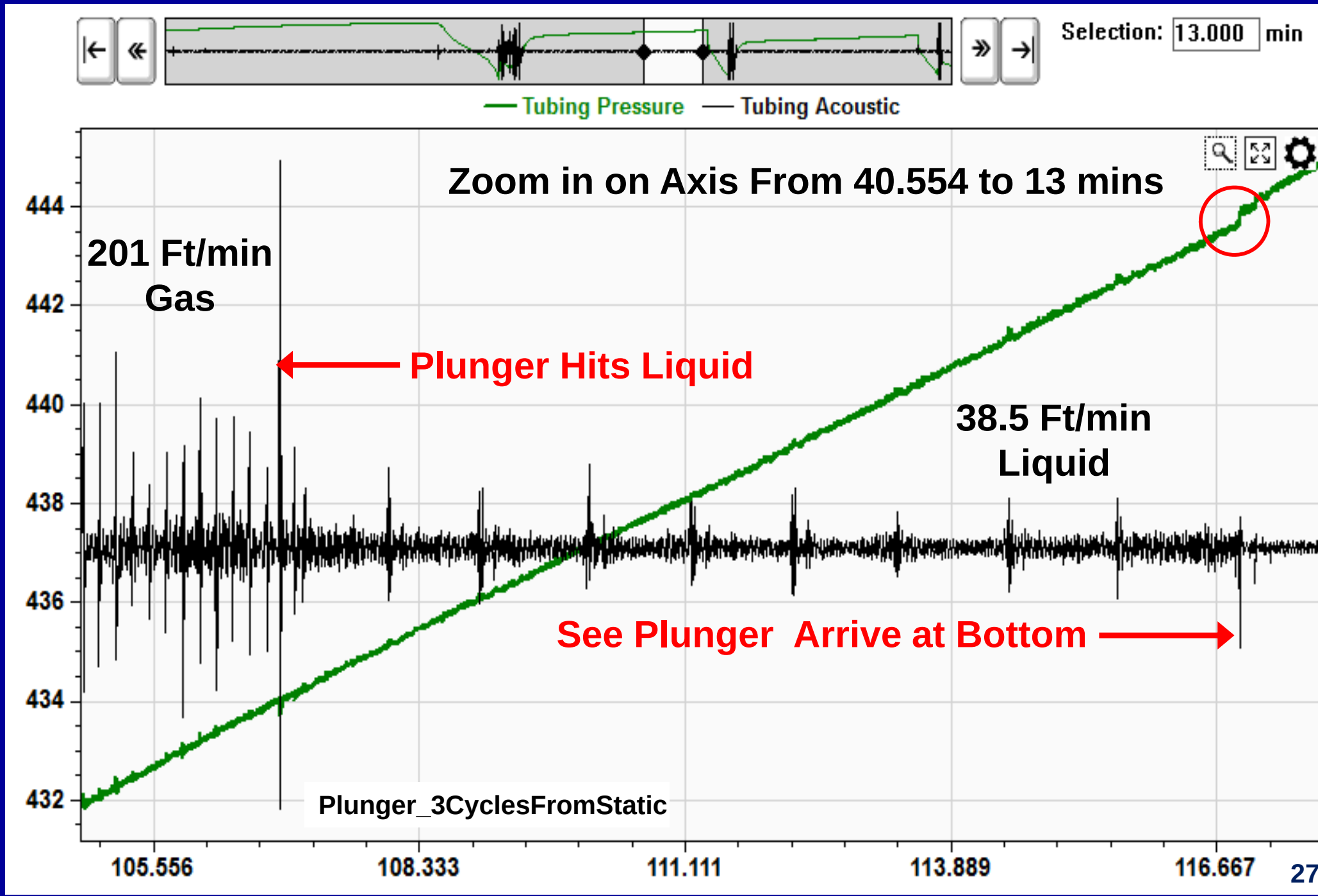


Pick Beginning of Shut-in When Tubing Pressure Just Starts to Increase

0.3 Min of Pressure & Acoustic Data Shows 0.2 psi Pressure Wave Created at Collar # 112



Minimize Unnecessary Shut-in Time



Gas Properties Determined by Fall

Define Cycle | Cycle Limits | Plunger Fall | Gas Properties

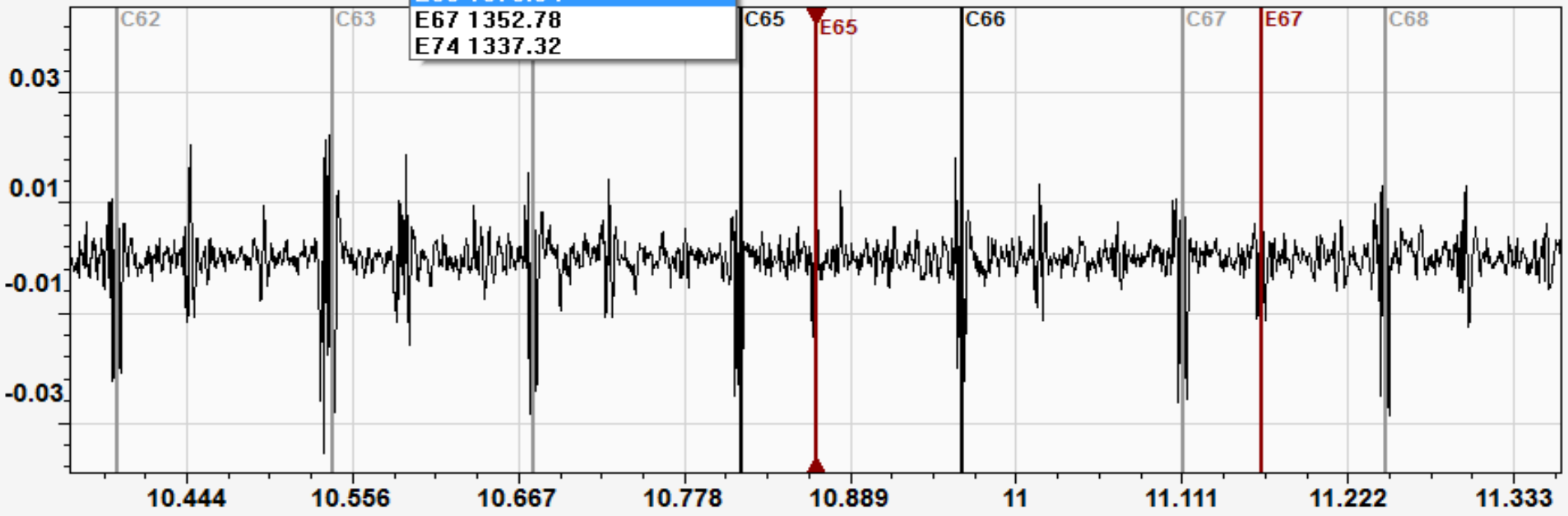
Determine Gas Specific Gravity by Selecting Echo Repeats

Acoustic Velocity: 1364.53 ft/sec

E65 1370.34 | Remove | Done

E57 1352.14
E65 1370.34
E67 1352.78
E74 1337.32

Tubing Acoustic



Enter Gas Specific Gravity, Composition Analysis, or Acoustic Velocity

Acoustic Velocity: 1369.58 ft/sec

Retrieve Gas Gravity from Previous Acoustic Test

Acoustic Velocity: 757.14 ft/sec

The liquid level test used for analysis:
10/15/2004 05:08:10AM

Plunger_Hole in Tbg Deep

Acoustic Velocity 1364.53

Gas Specific Gravity 0.65400 (Air = 1)

Troubleshooting by Tracking Plungers

1. Find holes in tubing of Gas wells or Plunger Lift wells by monitoring tubing and casing pressure while using acoustic to determine depth as plunger is falling.

2. Releasing plunger from the lubricator catcher, causes 2 to 3 psi drop in the tubing pressure as differential pressure is used to support plunger while falling.

3. Tubing pressure will increase by 2 to 3 psi, when plunger falls by a hole or stops. There “may” be a decrease in casing pressure.

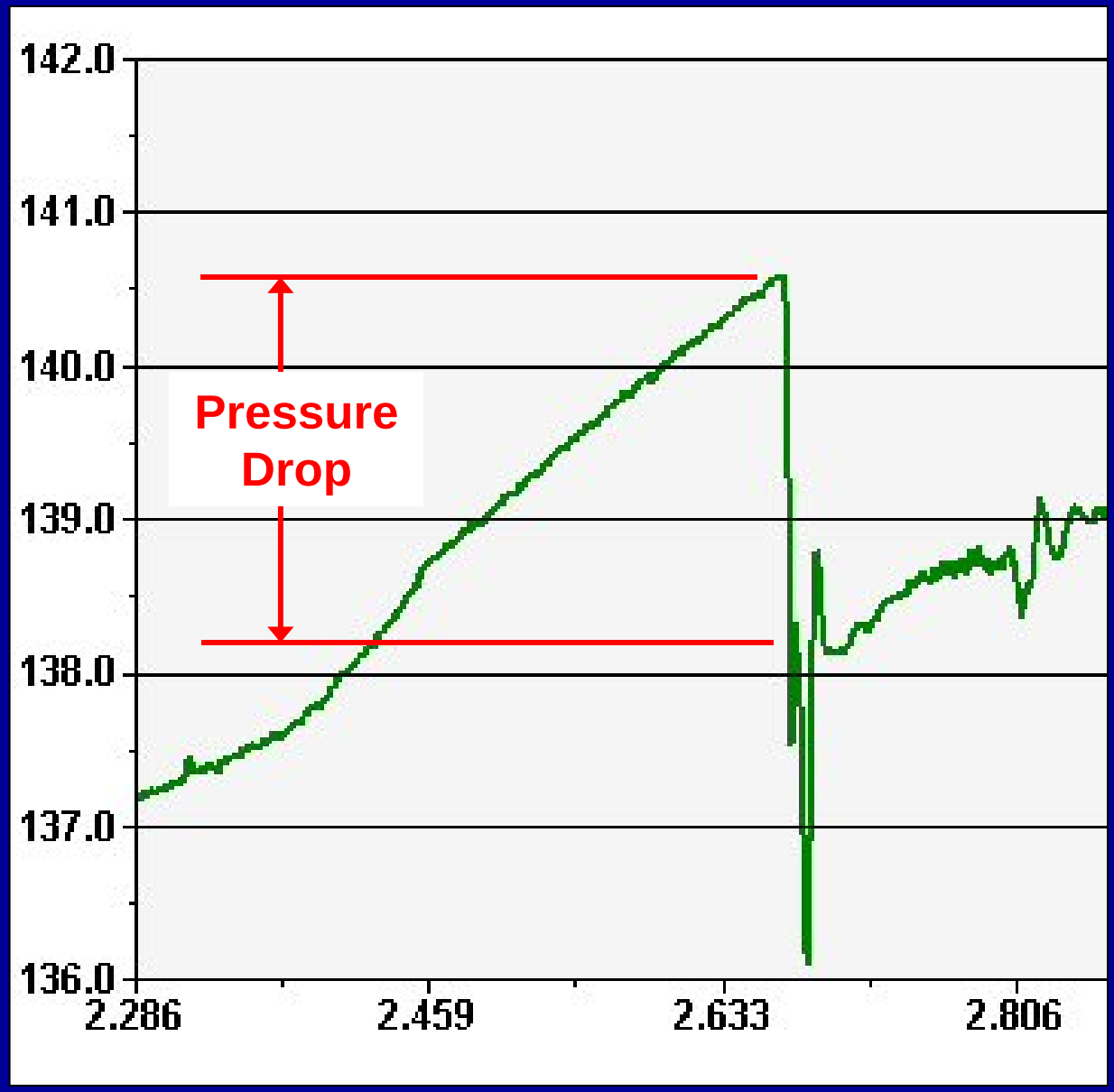
4. Collars can be counted from the time the plunger starts falling to the time the pressure increases.

5. Procedure determines depth to stuck plunger or hole.

When Shut-in Begins the Tubing Pressure Drops as Plunger Starts to Fall

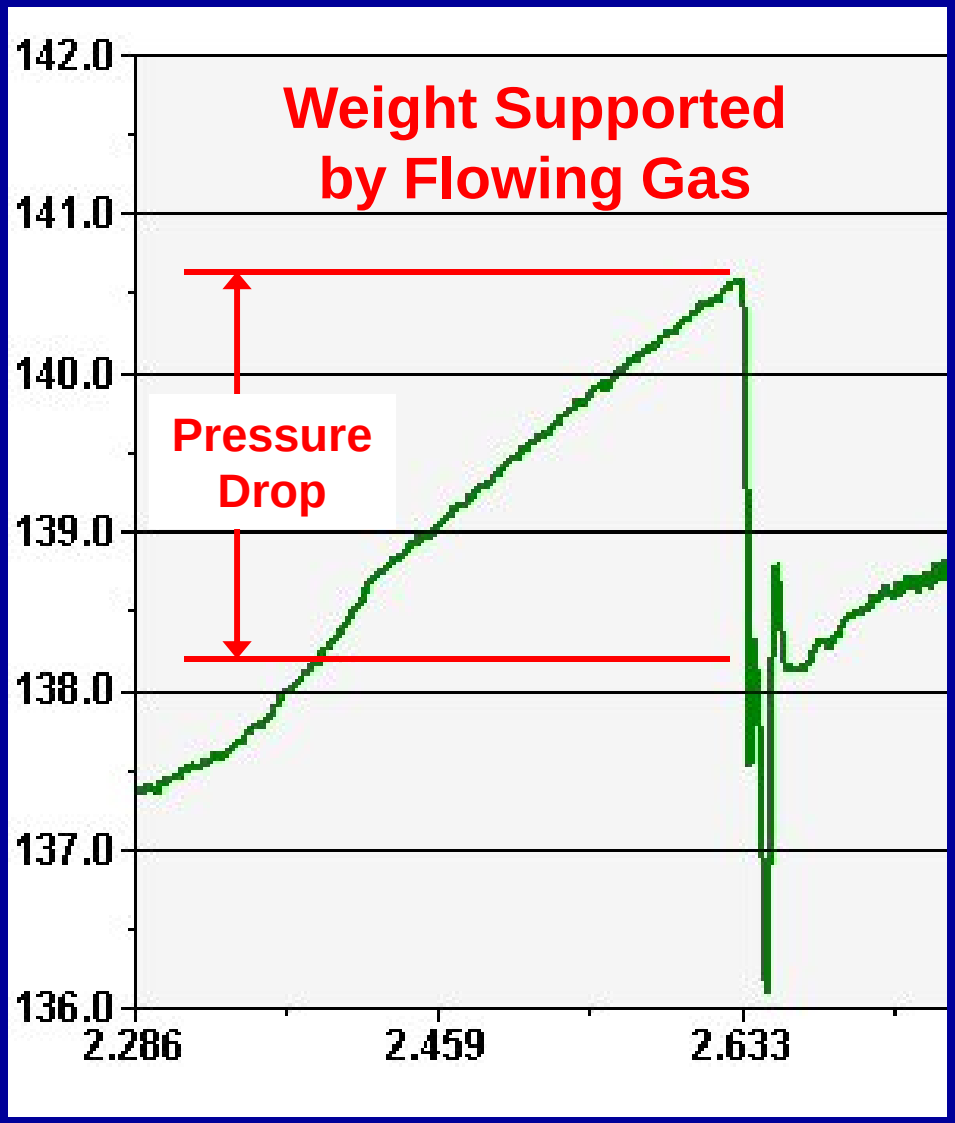
Pressure Drop = Weight / Area

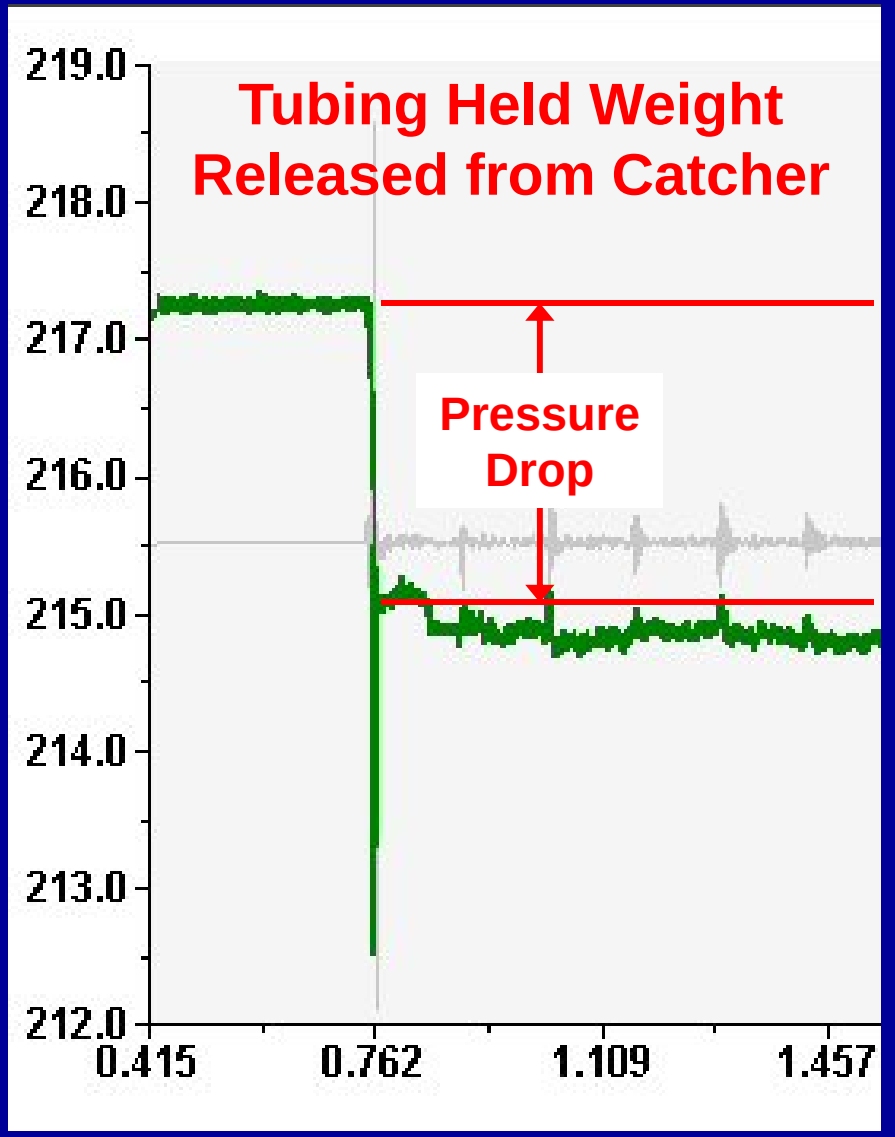
Pressure Drop = **2.4 psi**



Plunger weight (8 lbs) / Area of 2-3/8”

Shut-in Begins and Tubing Pressure Instantly Drops as Plunger Starts to Fall



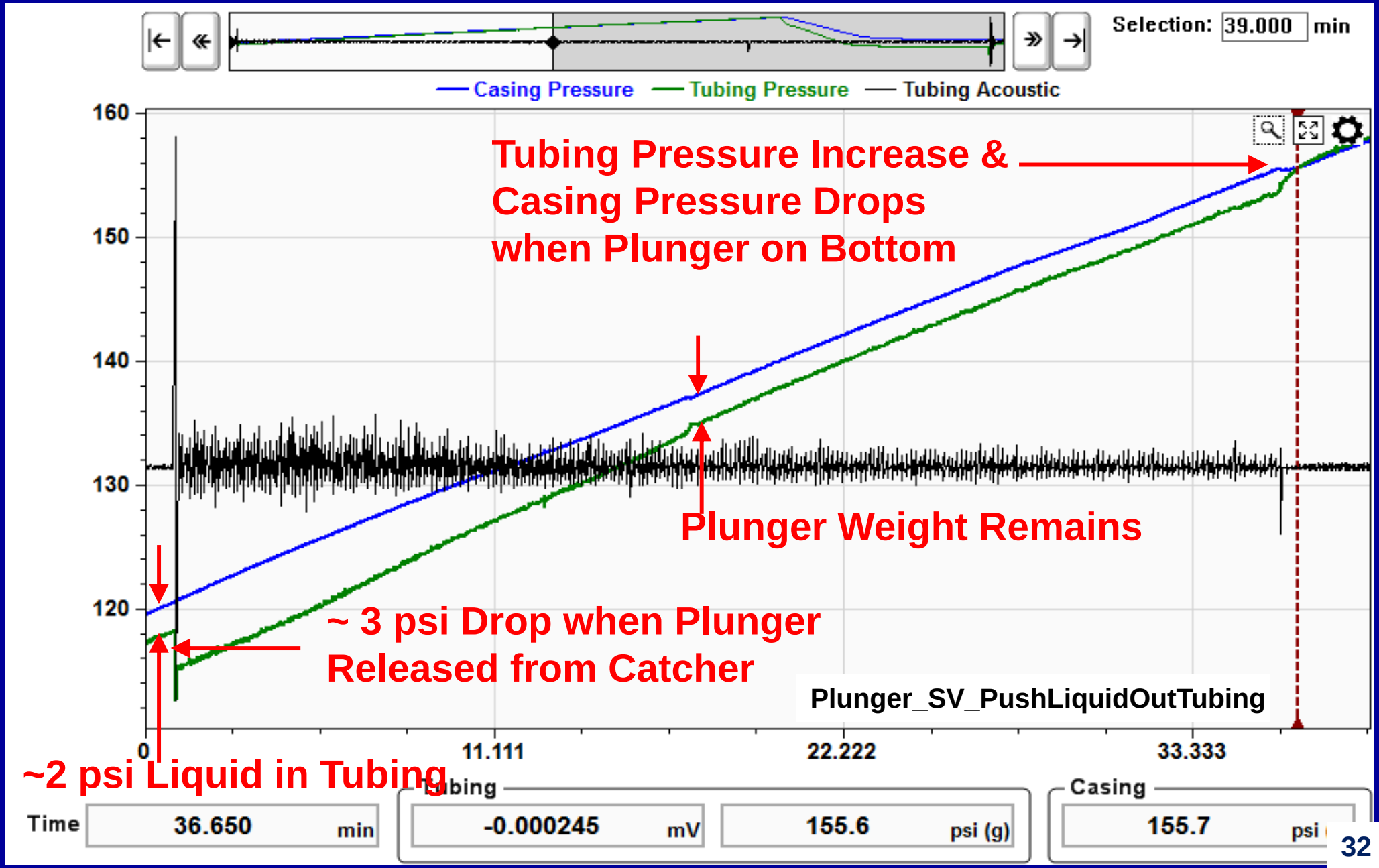


Pressure Drop = Weight / Area

Plunger weight (8 lbs) / Area of 2-3/8”

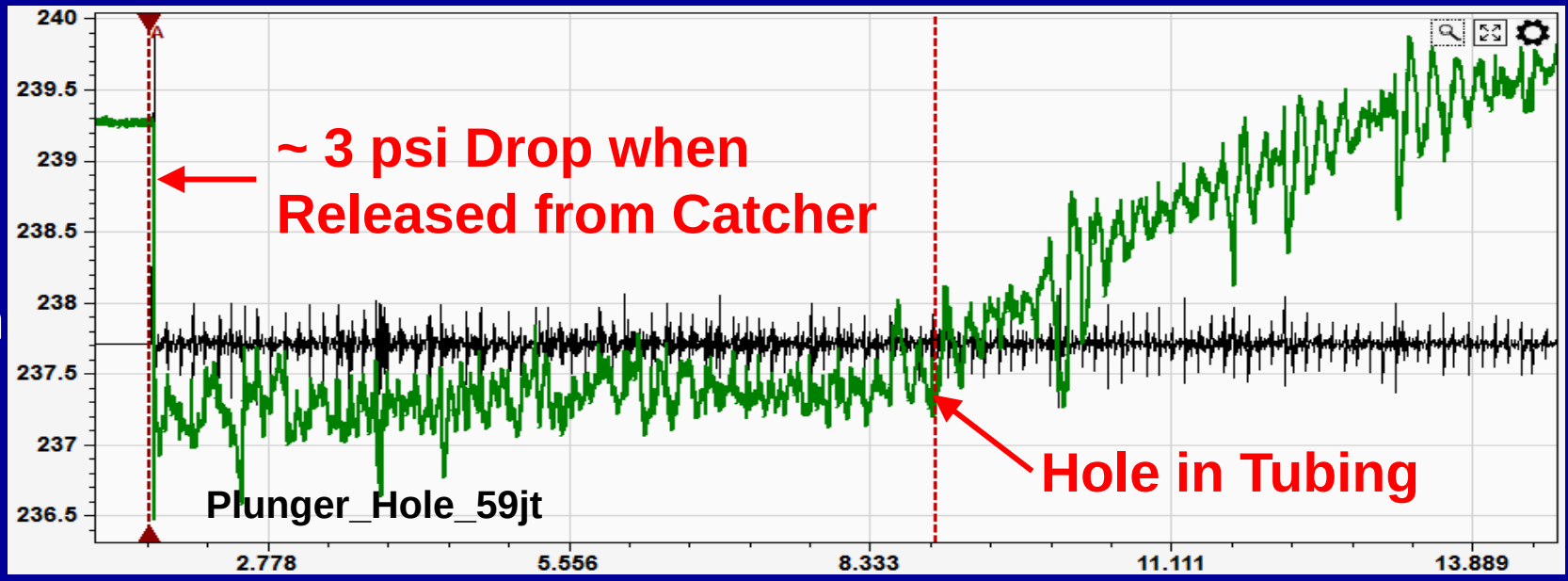
Tubing & Casing Pressure

React to Plunger Falling in Well

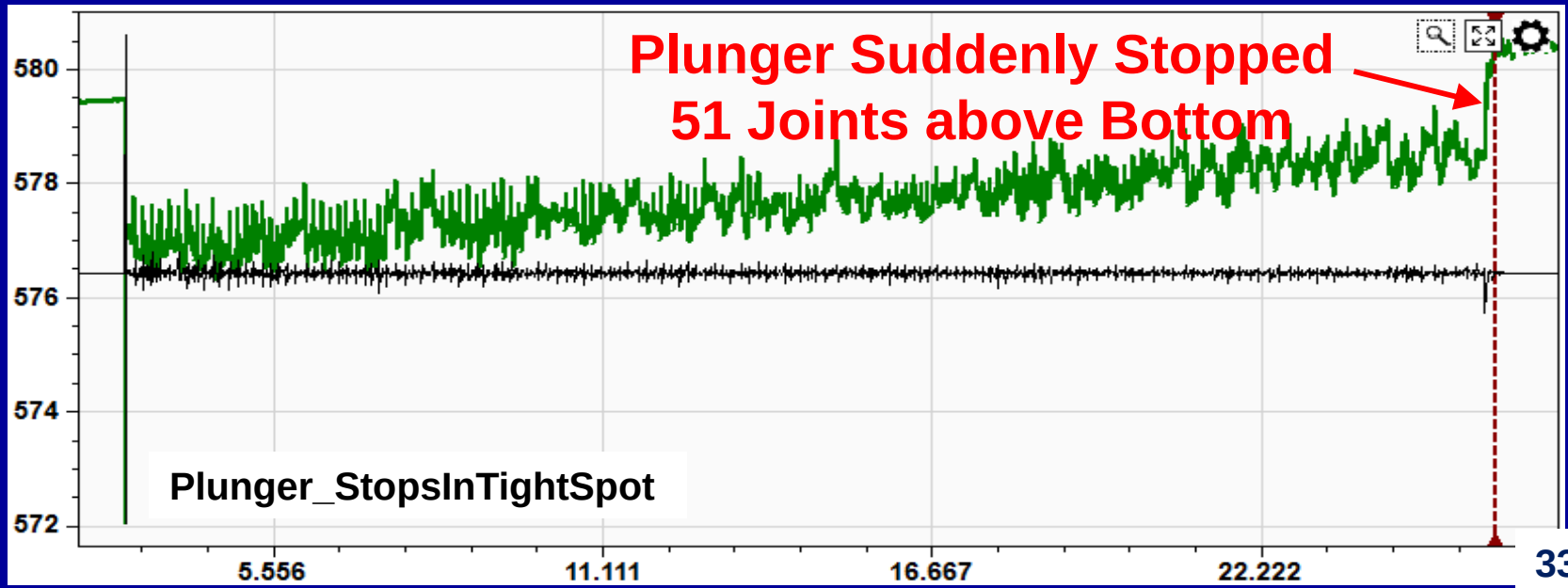


Tubing Pressure Change Helps to Identify Downhole Problems

Plunger falls Past Hole at 1800 feet and Pressure from Casing Flows Into Tubing



Rapid Tubing Pressure Increase if Plunger has Sudden Stop

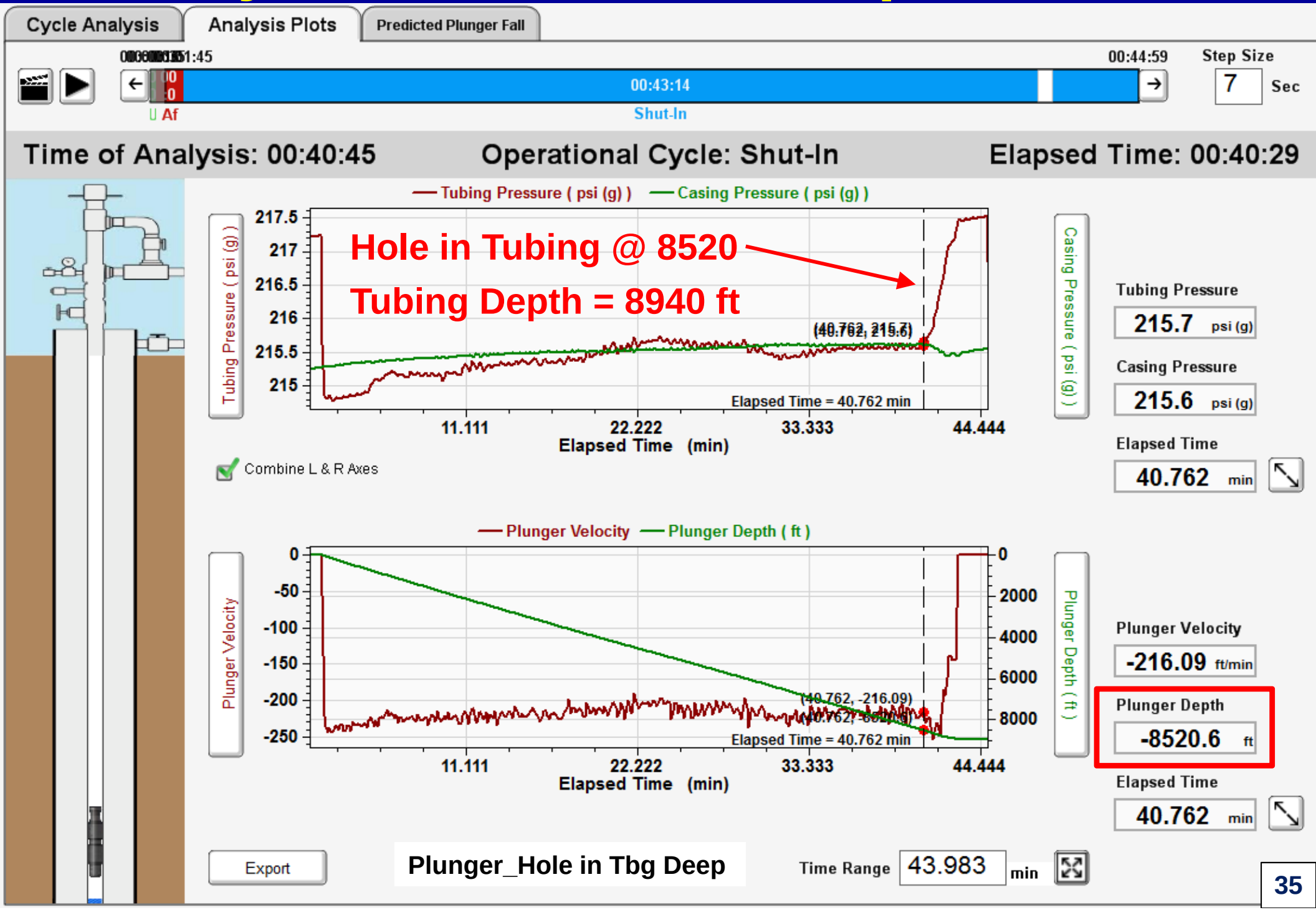


Hole in Tubing

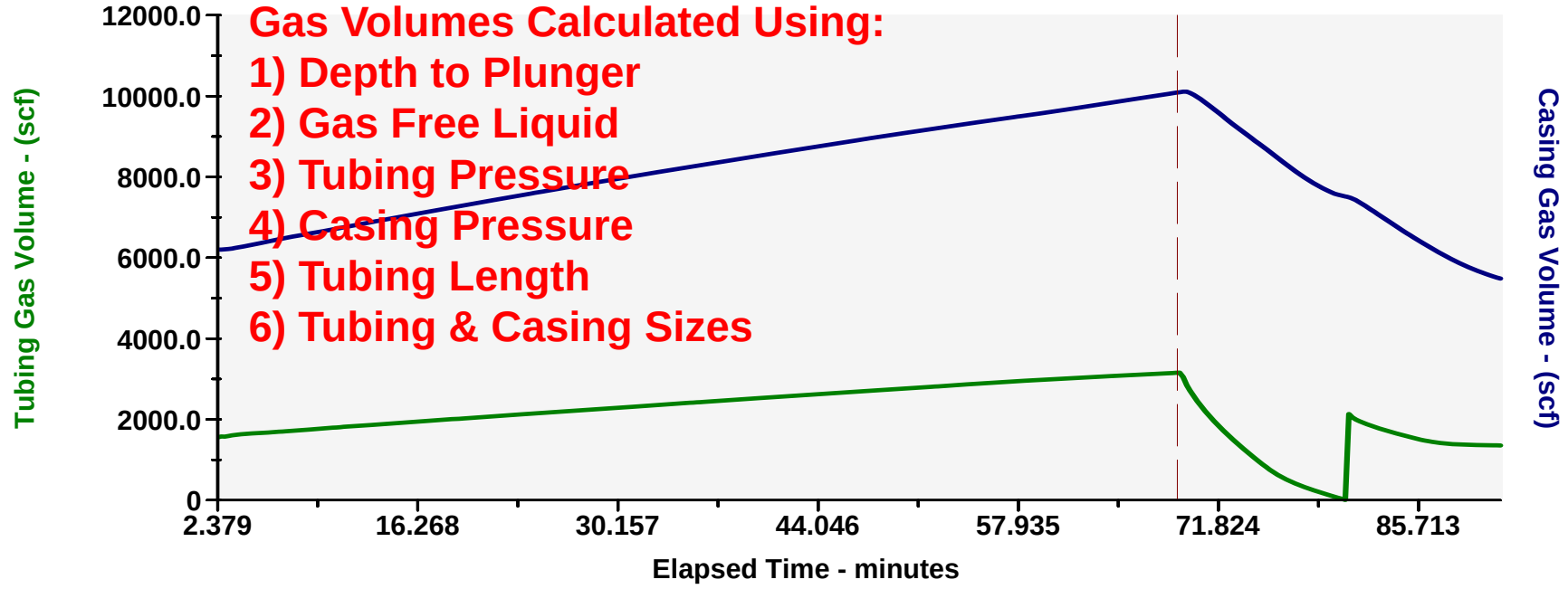
1) Hole was 156 jts from surface or 5054' based on 32.4' joint lengths
2) Hole measured with micrometer to be 0.160” by 0.125”.

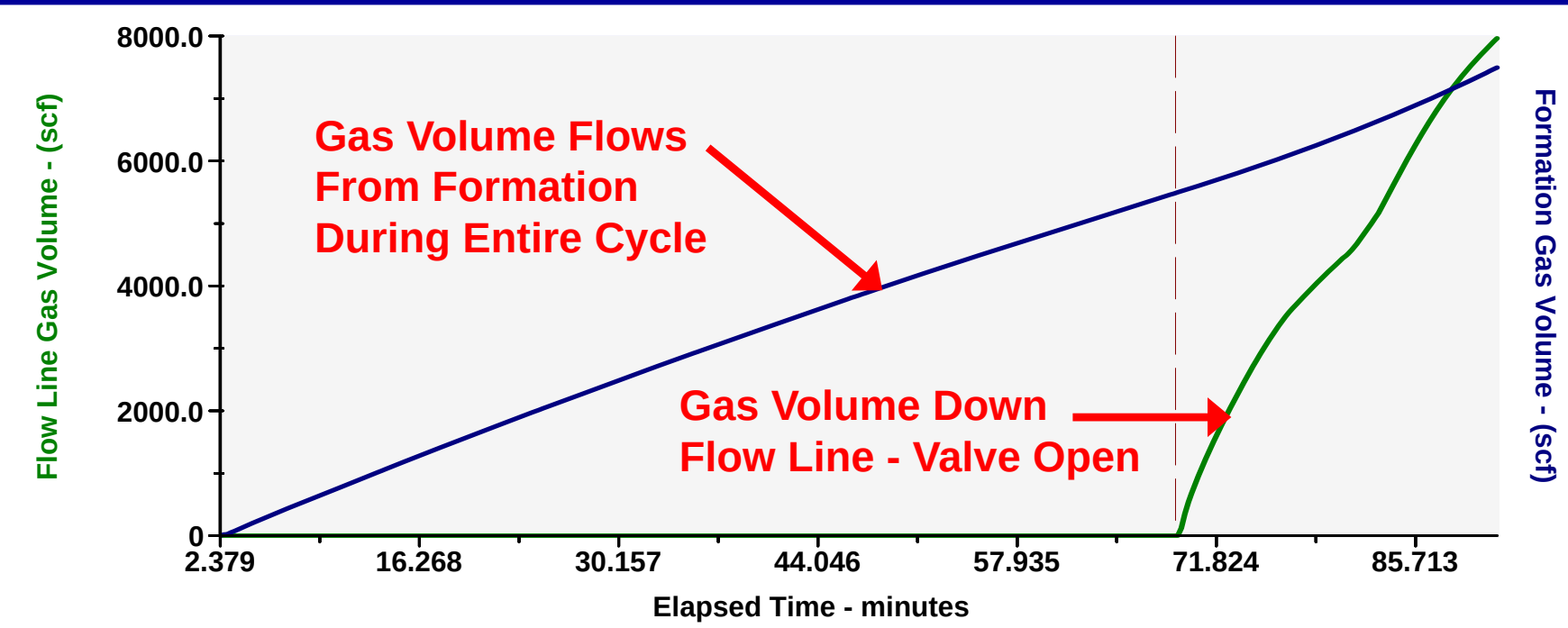
© Echometer Company

Analysis Plots Shows Depth to Hole



Gas Flow Rates During Cycle





Know Where the Plunger Is

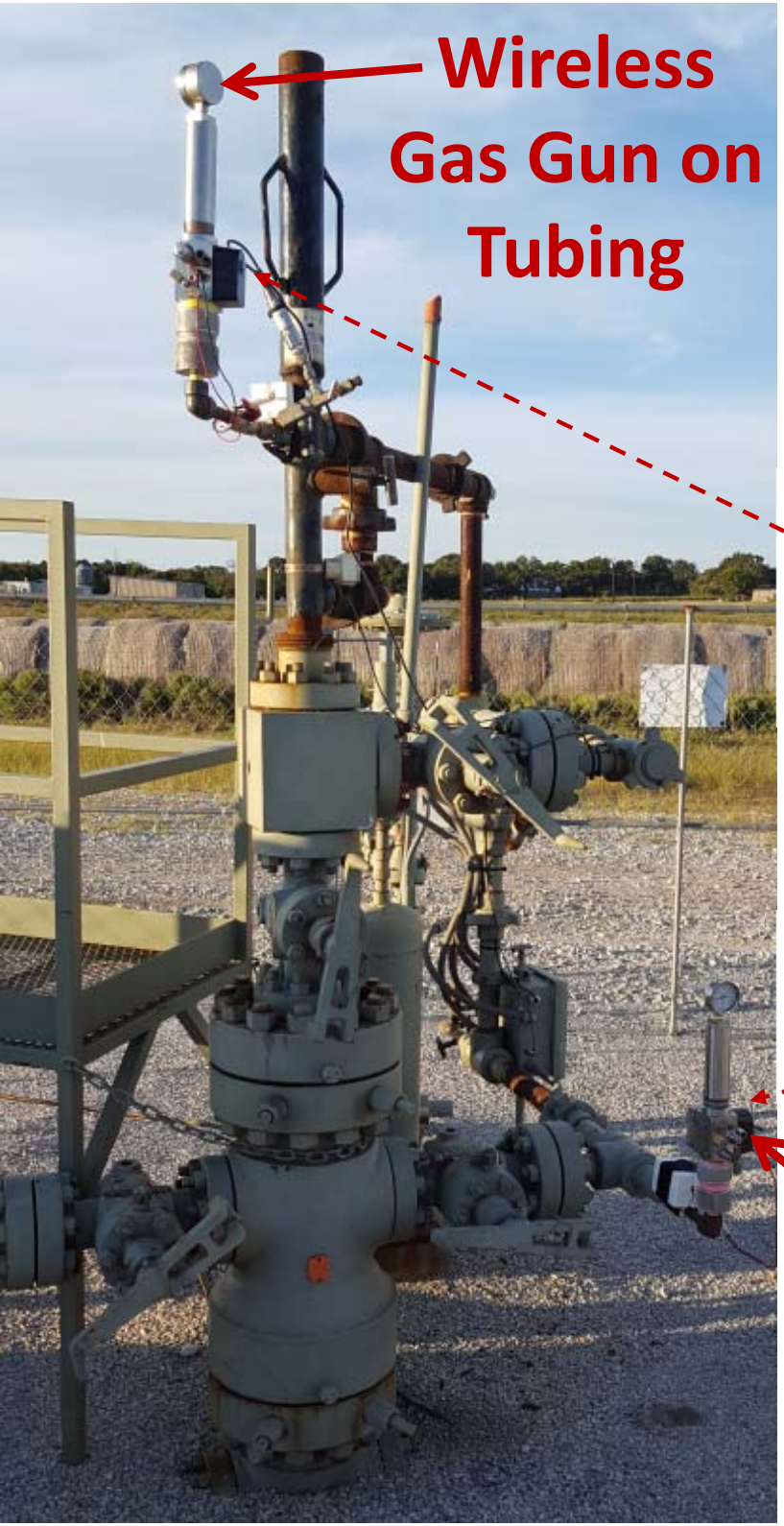
1. Plunger Lift Tracking increases safety of plunger lift operations by knowing where the plunger is in the tubing.

2. If a plunger is not going to bottom and the well is pressured up, then the plunger could surface dry at a very high velocity.

3. High Velocity Can damage equipment!

4. Arrival at high velocity can cause equipment damage and could result in exceeding the mechanical integrity limits of the lubricator

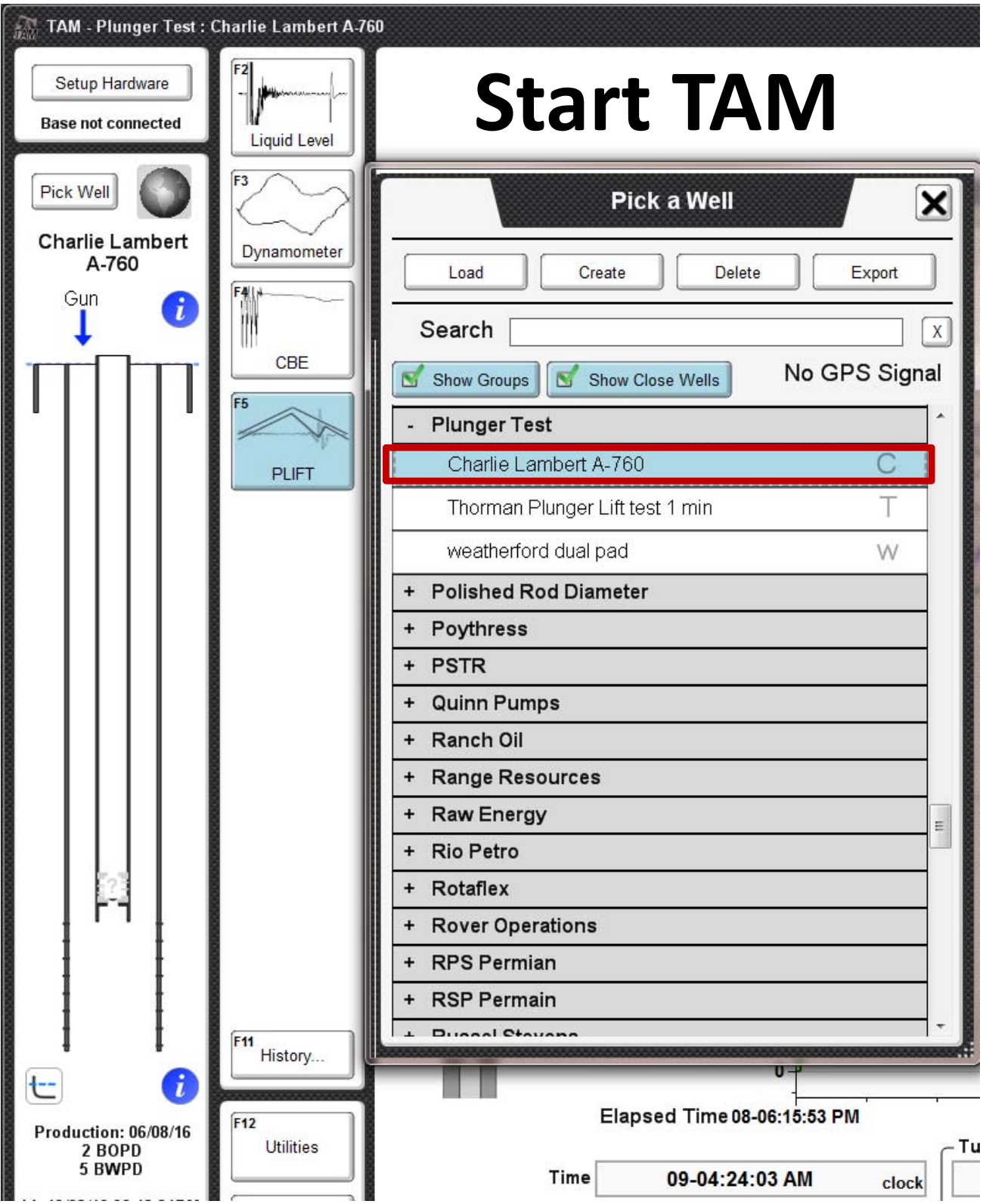
Steps to Track a Plunger Using Wireless & TAM



Good Line-of-sight

Good Line-of-sight

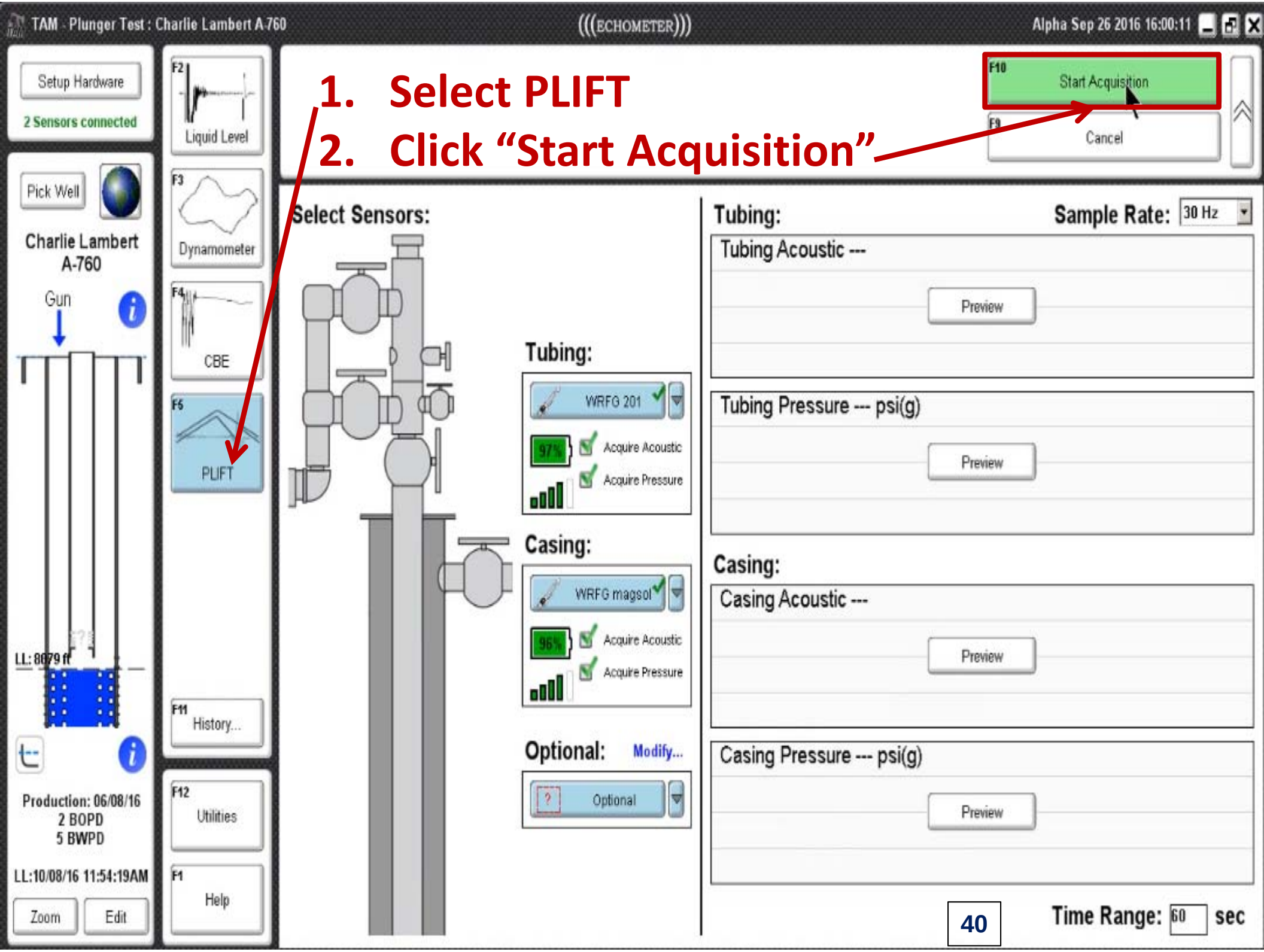
Wireless Gas Gun OR
Pressure Sensor on Casing



1. Click “Pick Well” and Double Click Well name for the well where data is to be acquired.

2. Use Create… to create a New Well if one does not exist.

3. Be sure to enter at least: daily production rates, tubing & casing sizes, average joint length, tubing & S/N depth and formation depths.

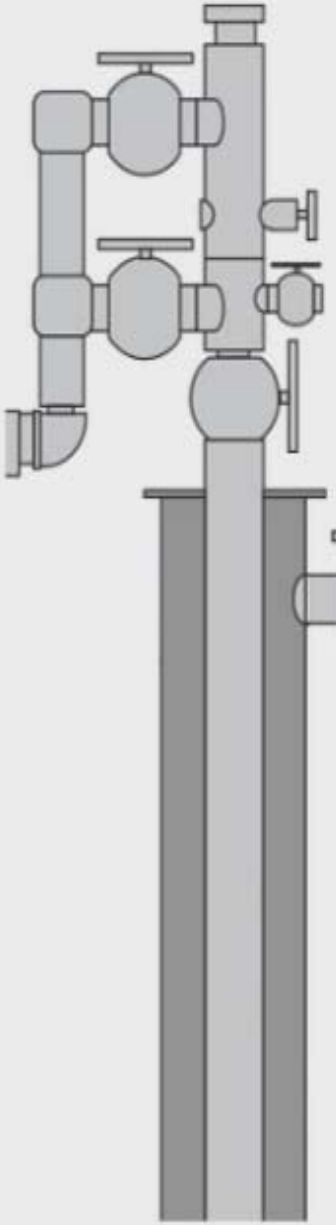

TAM - Plunger Test : Charlie Lambert A-760
(((ECHOMETER)))
Alpha Sep 26 2016 16:00:11
Setup Hardware
2 Sensors connected
Pick Well
Charlie Lambert A-760
Gun
LL: 8079 ft
Production: 06/08/16
2 BOPD
5 BWPD
LL:10/08/16 11:54:19AM
Zoom
Edit
F2 Liquid Level
F3 Dynamometer
F4 CBE
F5 PLIFT
F11 History...
F12 Utilities
F1 Help
1. Select PLIFT
2. Click "Start Acquisition"
F10 Start Acquisition
F9 Cancel
Select Sensors:
Tubing:
WRFG 201
97%
Acquire Acoustic
Acquire Pressure
Casing:
WRFG magsol
96%
Acquire Acoustic
Acquire Pressure
Optional:
Modify...
Optional
Tubing:
Sample Rate:
30 Hz
Tubing Acoustic ---
Preview
Tubing Pressure --- psi(g)
Preview
Casing:
Casing Acoustic ---
Preview
Casing Pressure --- psi(g)
Preview
Time Range:
60
sec

Identify Sensors

F2 Liquid Level
F3 Dynamometer
F4 CBE
F5 PLIFT
F11 History...
F12 Utilities
F1 Help

F10 Start Acquisition
F9 Cancel

Select Sensors:



Tubing:
WRFG 201
100%
Acquire Acoustic
Acquire Pressure

Casing:
Optional

Optional: Modify...
Optional

Optional Sensor Attached to: Sales Line, Separator, or Other

Tubing: Sample Rate: 30 Hz

Tubing Acoustic ---

Identify Wireless Gas Gun Attached to Tubing

Preview

Tubing Pressure --- psi(g)

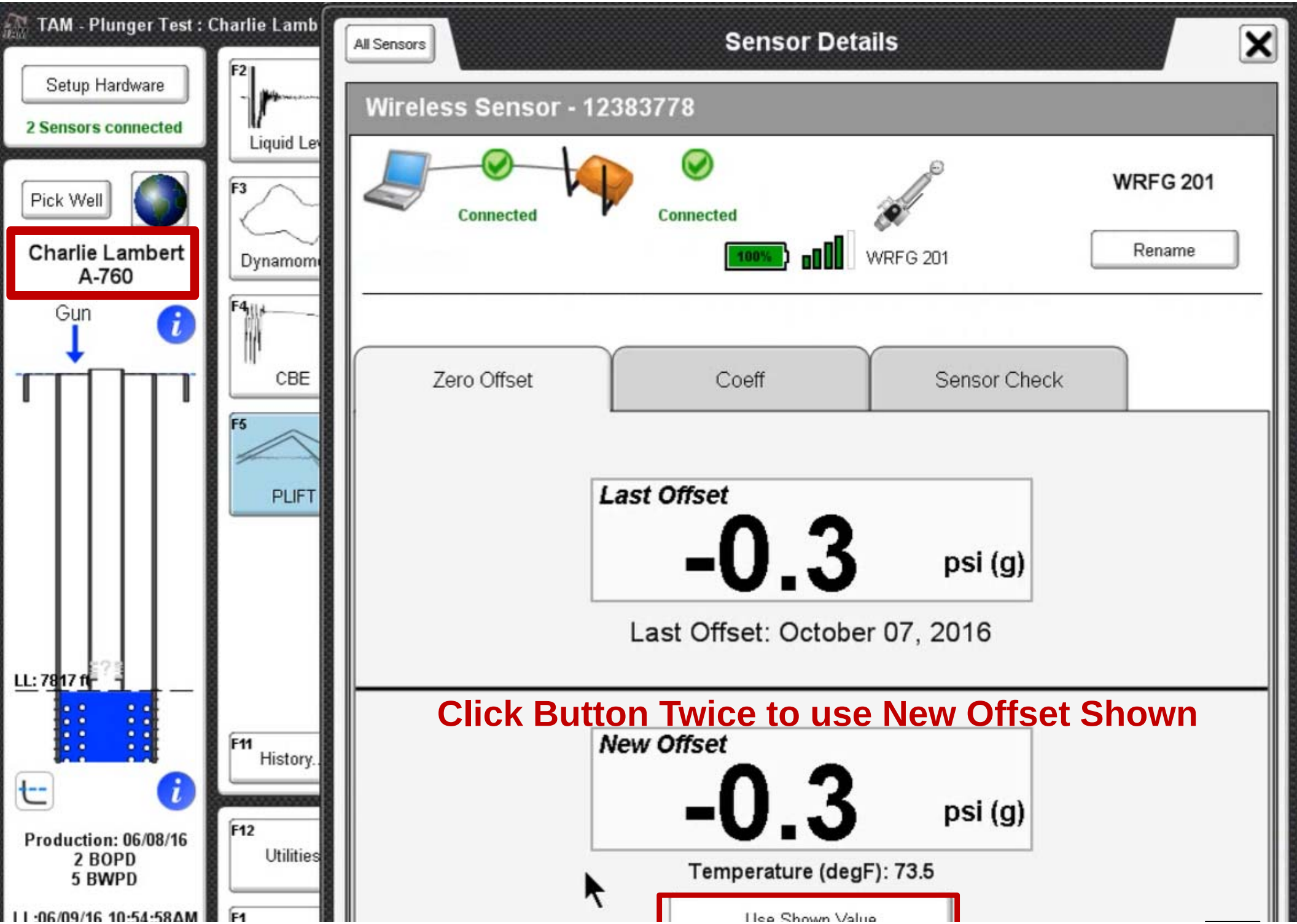
Select Sensor Close
WRFG magsol

Identify Wireless Gas Gun or Pressure Transducer Attached to Casing

Preview

Time Range: 60 sec

Obtain Zero Offset on Pressure Transducer



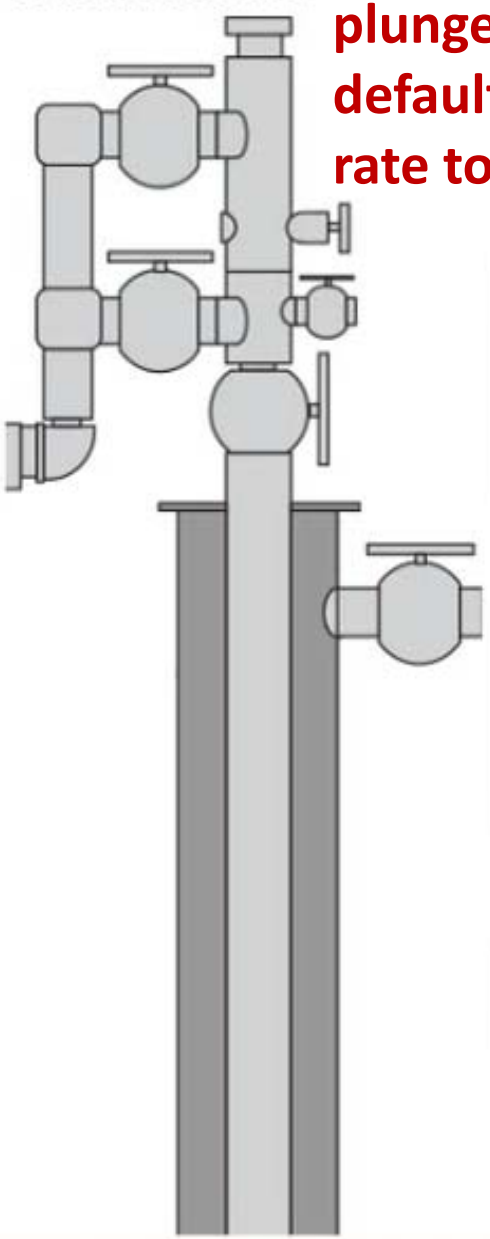
Confirm Each Sensor Attached to Tubing/Casing/Optional with Preview

10 Stop Previewing

F9 Cancel

Select Sensors:

For high fall speed plungers increase the default 30 Hz sample rate to 120 Hz.



Tubing:

ACQ WRFG 201

100% Acquire Acoustic

Acquire Pressure

Casing:

ACQ WRFG magsol

100% Acquire Acoustic

Acquire Pressure

Optional: Modify...

? Optional

Tubing: Sample Rate: 30 Hz

Tubing Acoustic 2.4

Tubing Pressure 217.0 psi(g)

Tubing Pressure Plot Increases when Valve Opened

Casing:

Casing Acoustic -0.9

Casing Pressure 242.0 psi(g)

Casing Pressure Values OK?

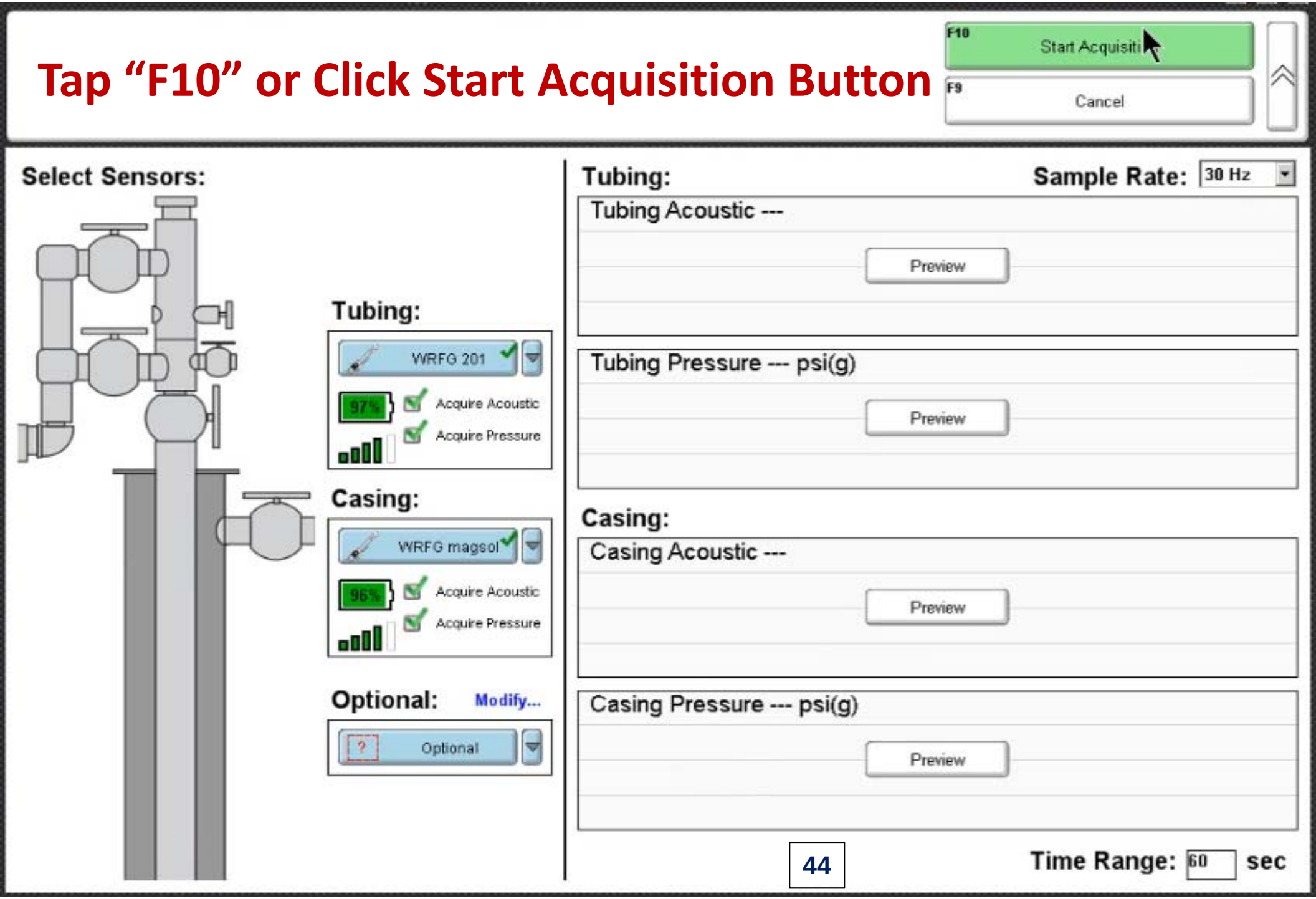
43

Not Saving Data

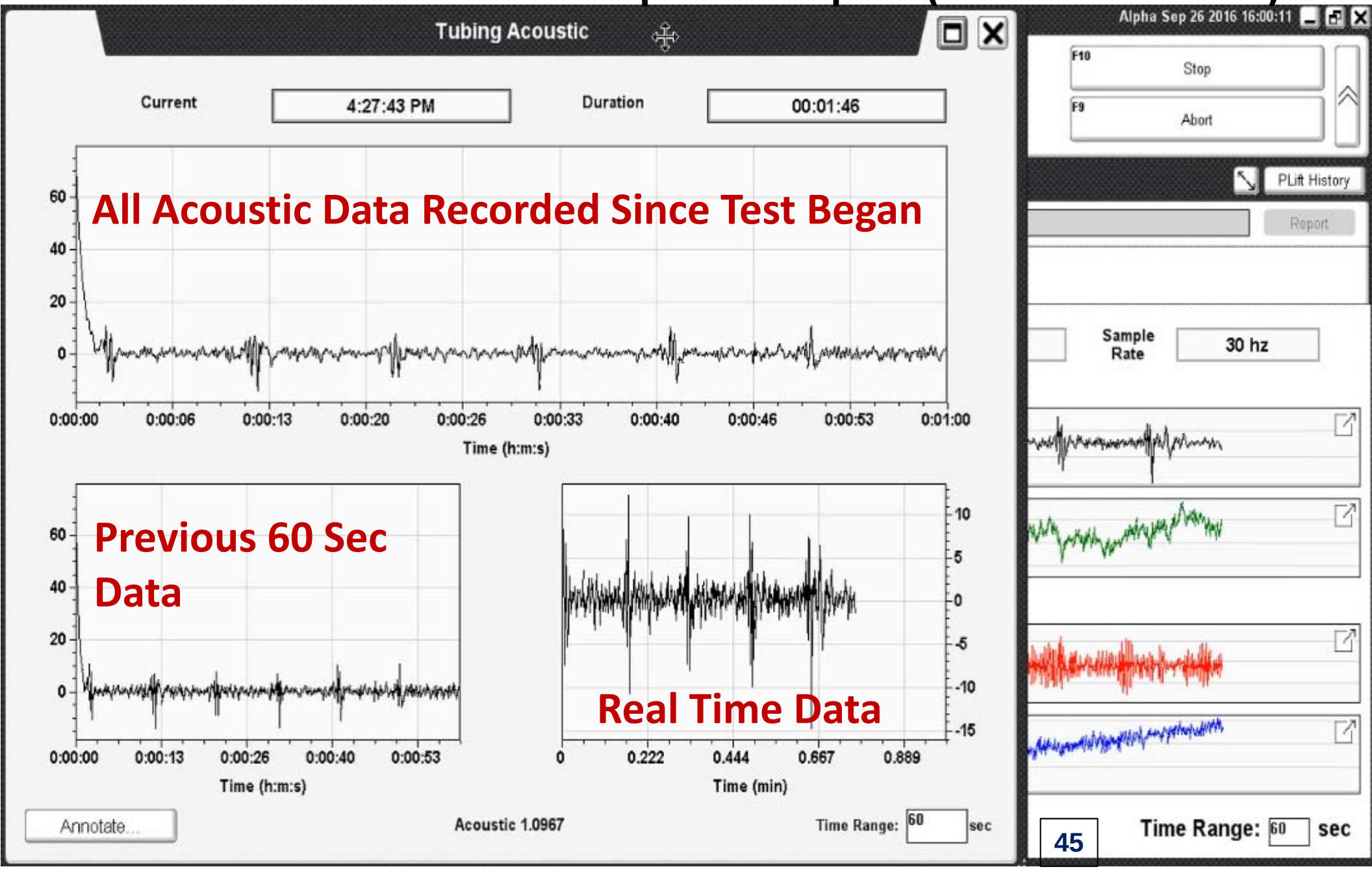
Time Range: 60 sec

Must Stop Preview To Begin Acquiring Plunger Lift Data

Tap “F10” or Click Start Acquisition Button

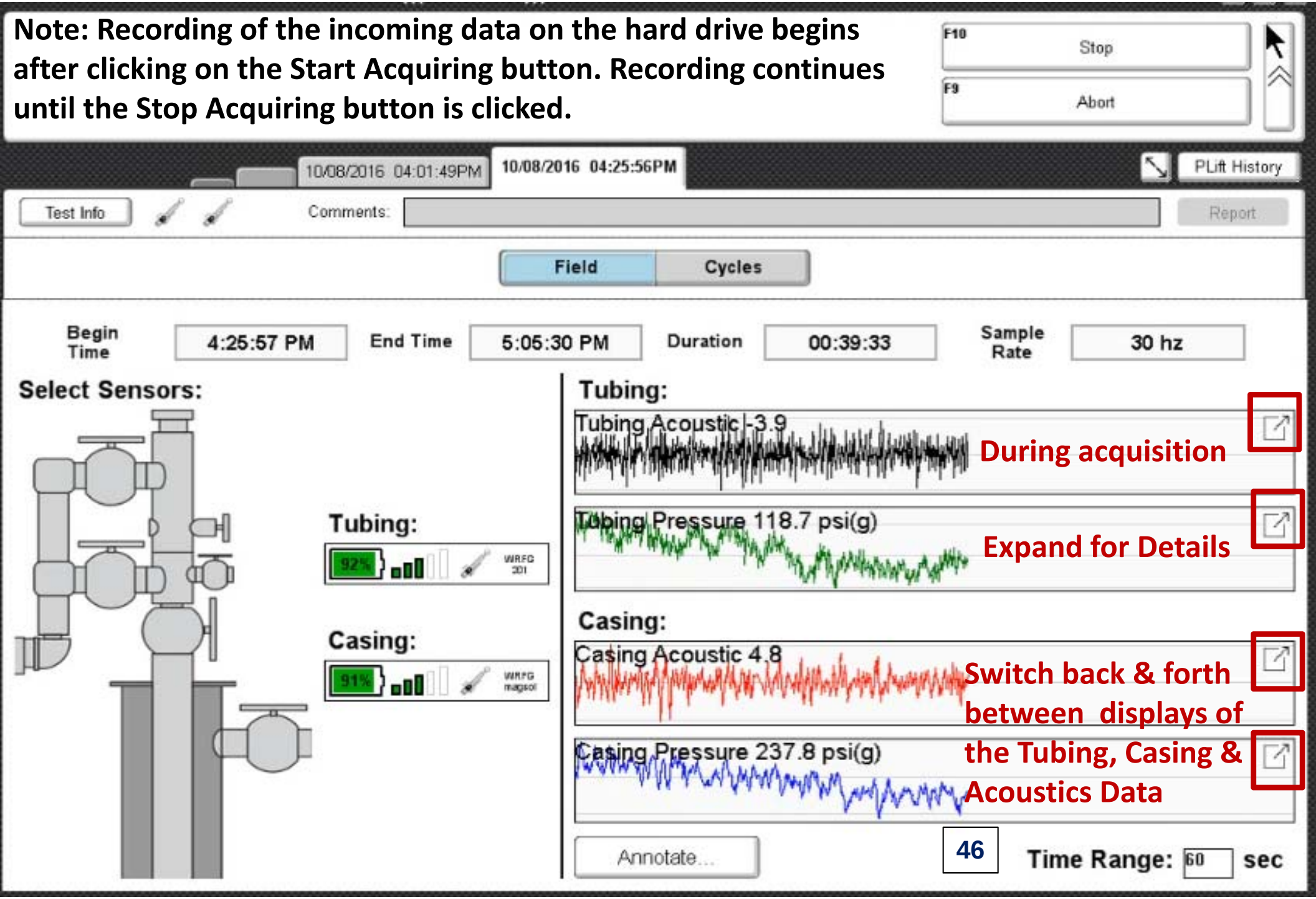


Real Time Data is displayed in Lower right-hand box. The Real Time Data is copied to the lower left-hand and upper graphs when the default Delta Time Axis time period elapses (Set at 60 seconds)

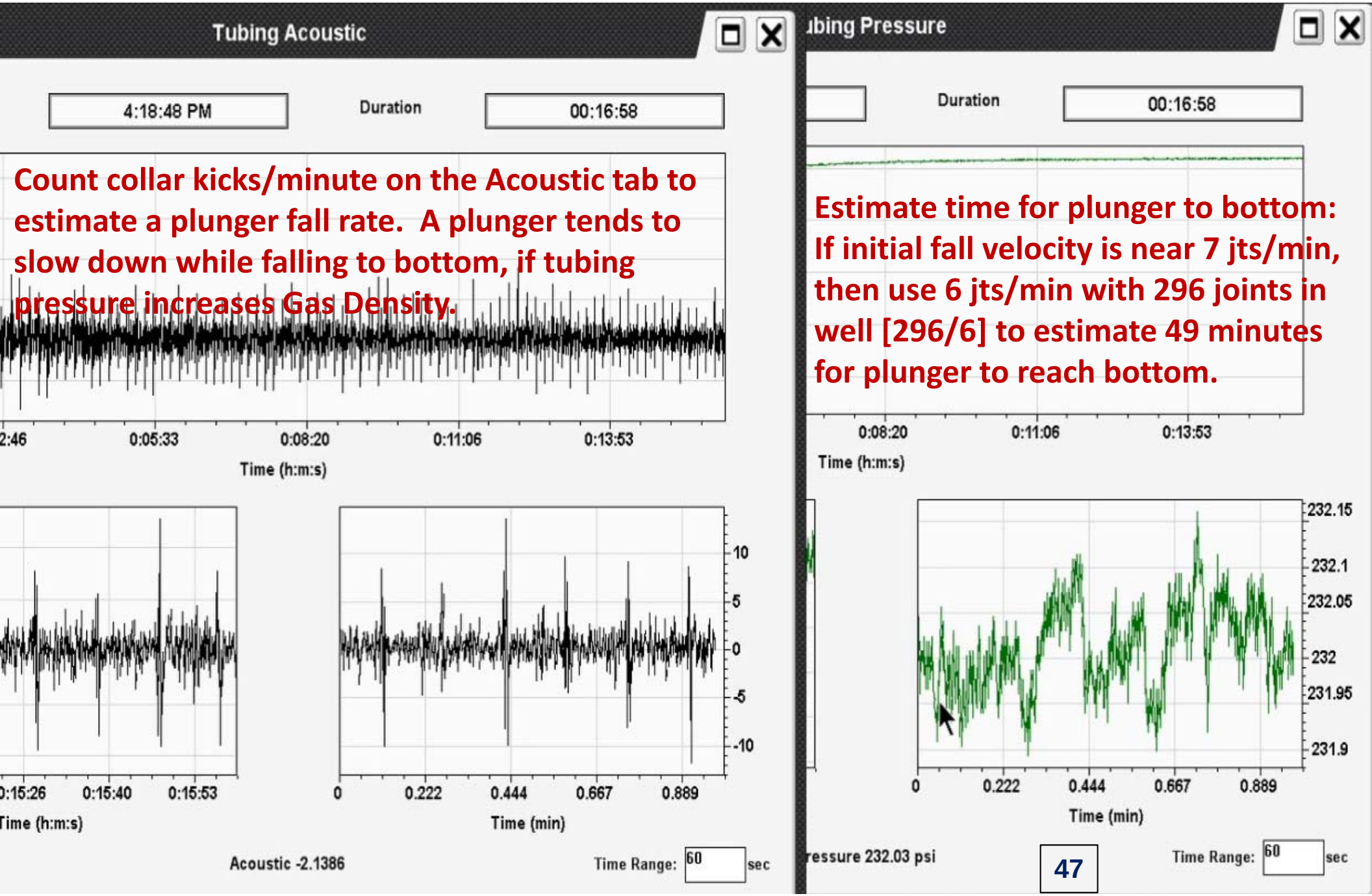


Begin Acquisition one minute+ before opening/closing of motor valve

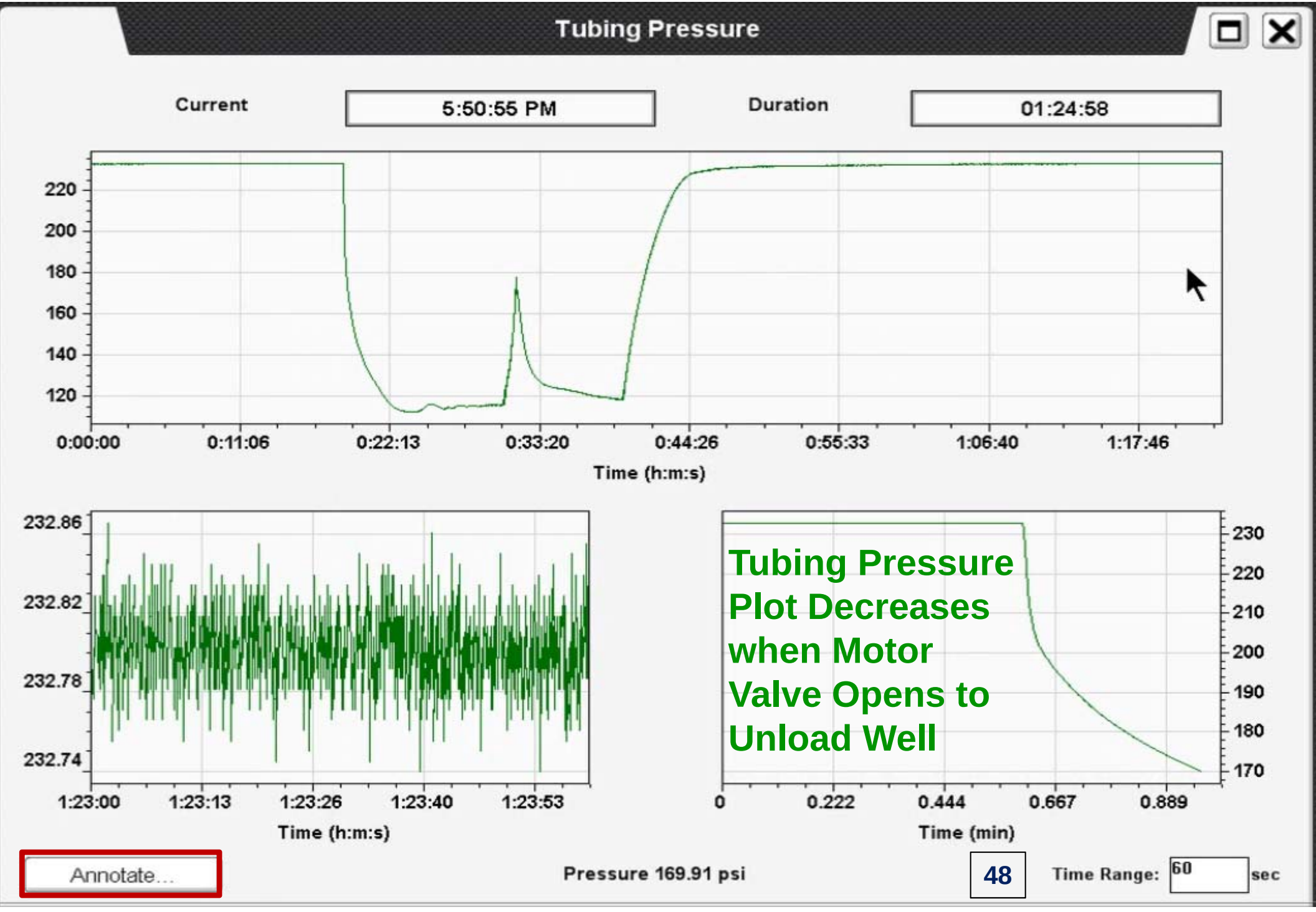
Note: Recording of the incoming data on the hard drive begins after clicking on the Start Acquiring button. Recording continues until the Stop Acquiring button is clicked.

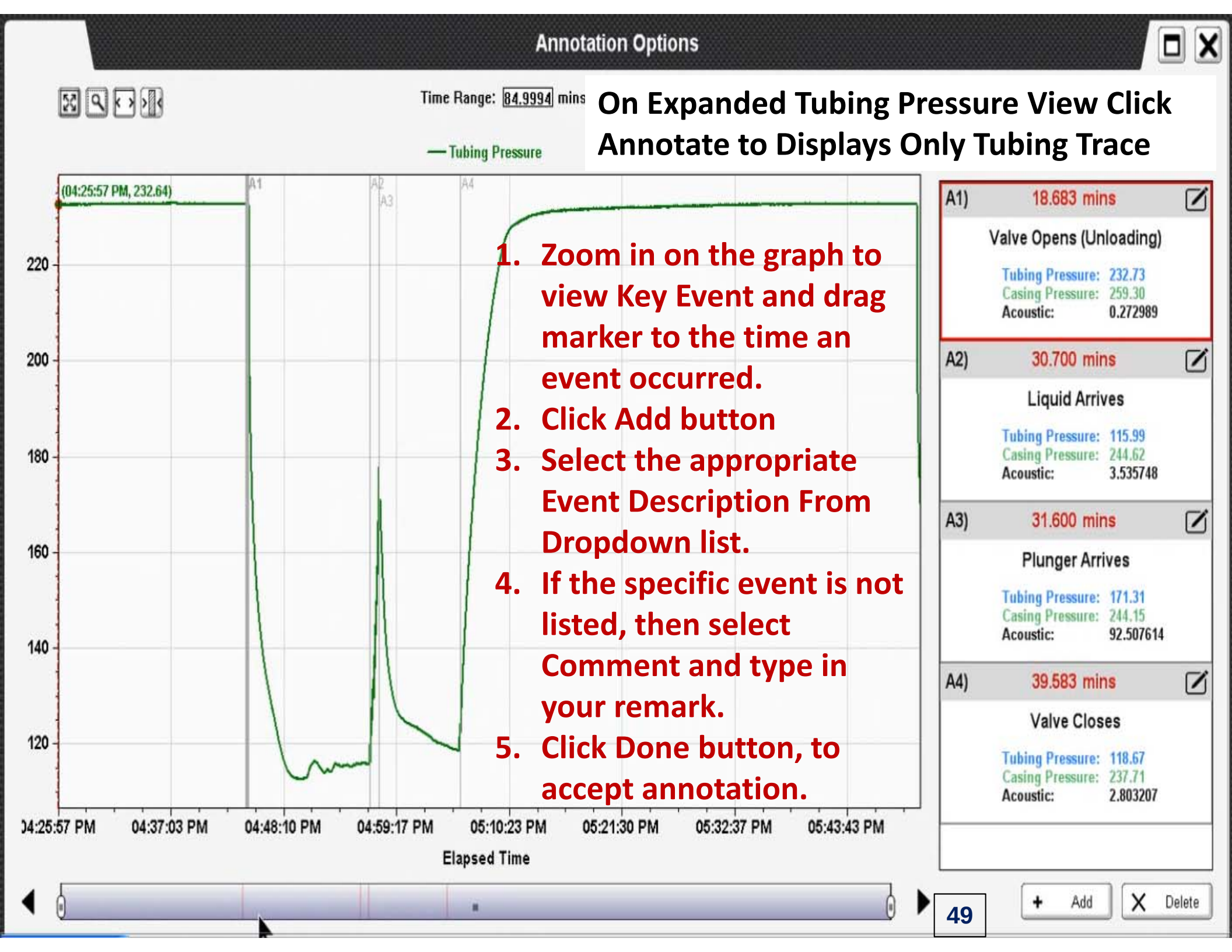


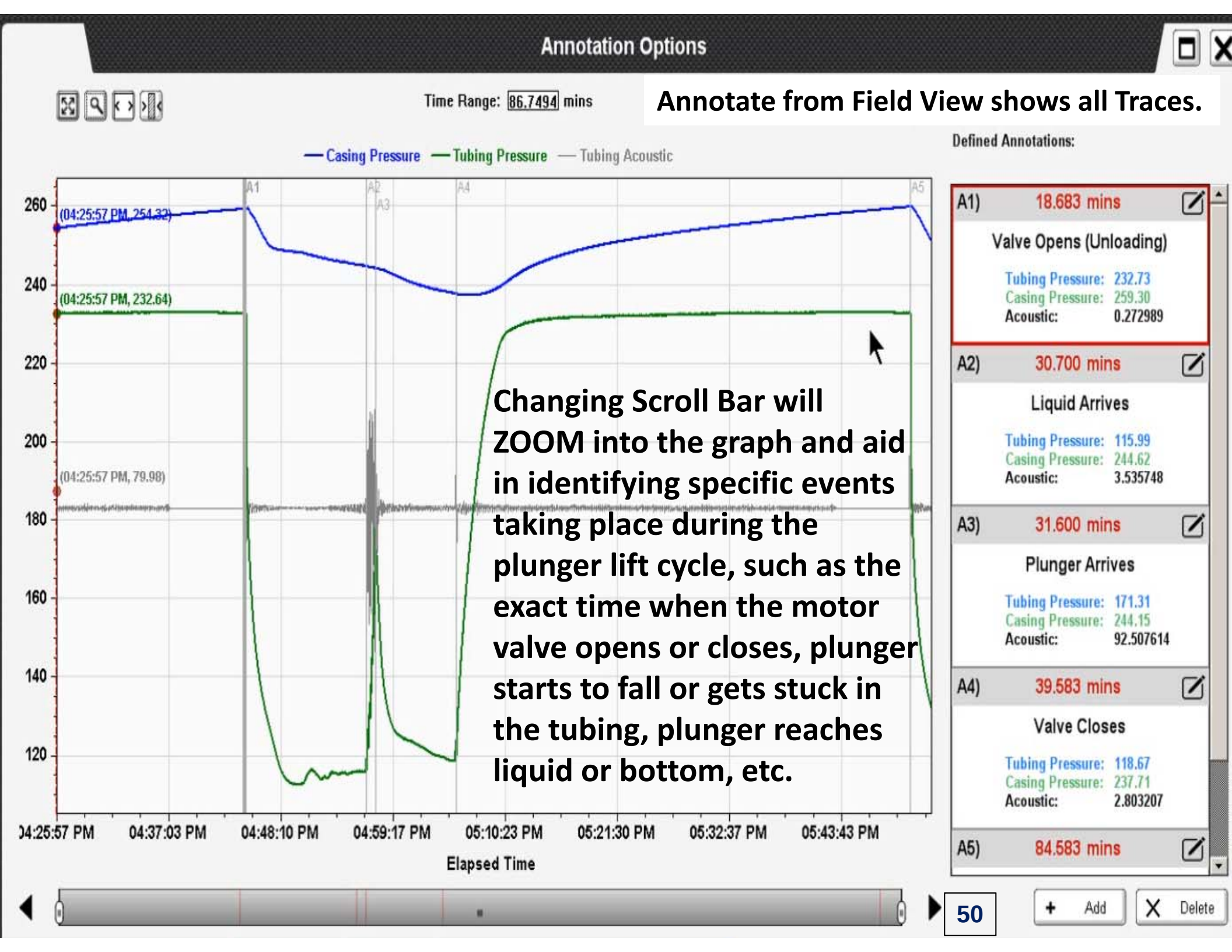
During the Shut-in time period while the plunger is falling, monitor the graphics on the Tubing, Casing and Acoustics Expanded View



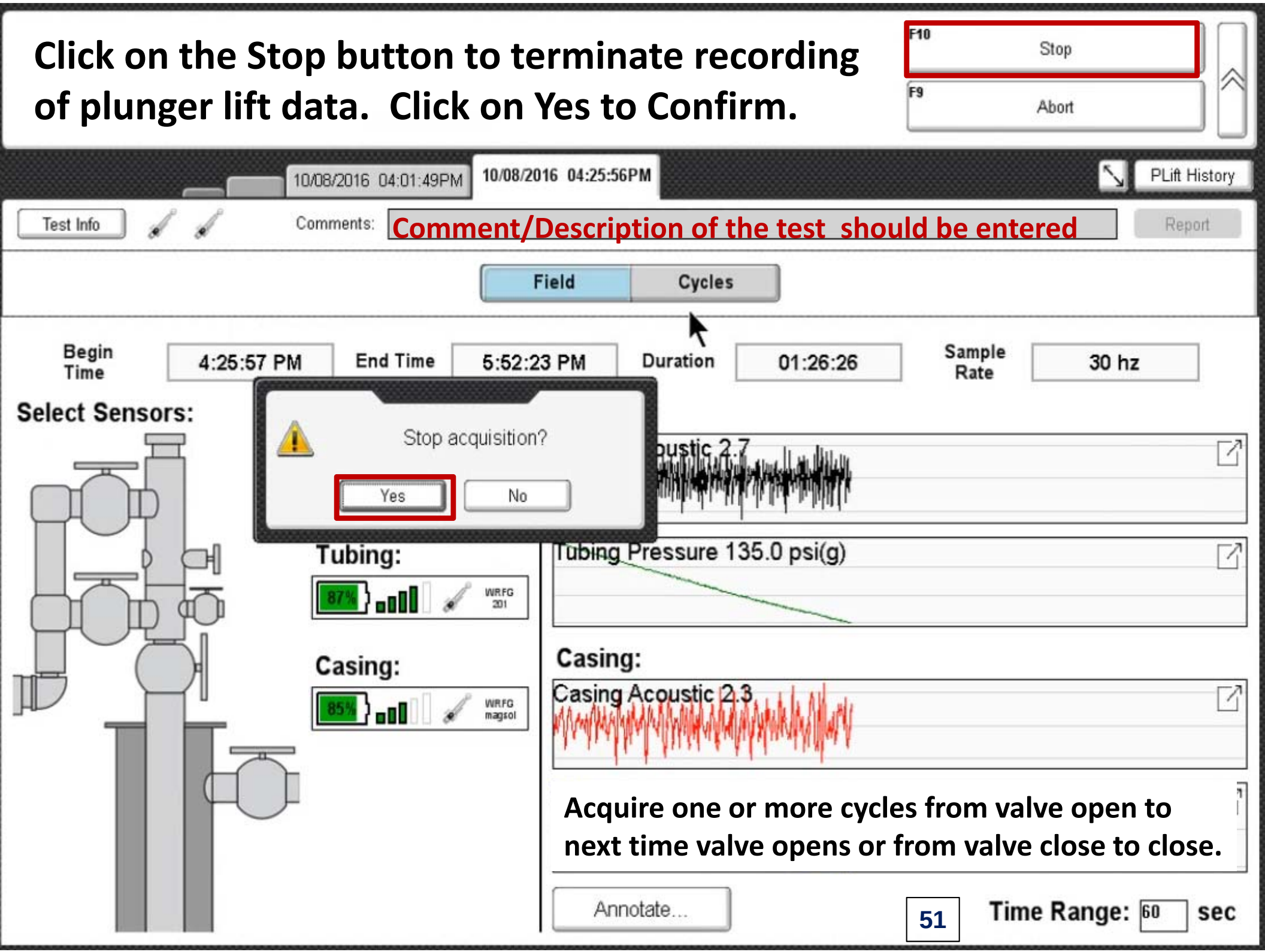
Click Annotate button to identify Key Events during Acquisition



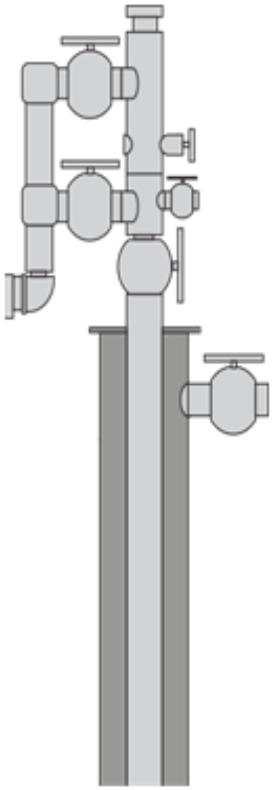

Annotation Options
Time Range: 84.9994 mins
On Expanded Tubing Pressure View Click Annotate to Displays Only Tubing Trace
— Tubing Pressure
(04:25:57 PM, 232.64)
A1
A2
A3
A4
220
200
180
160
140
120
04:25:57 PM
04:37:03 PM
04:48:10 PM
04:59:17 PM
05:10:23 PM
05:21:30 PM
05:32:37 PM
05:43:43 PM
Elapsed Time
1. Zoom in on the graph to view Key Event and drag marker to the time an event occurred.
2. Click Add button
3. Select the appropriate Event Description From Dropdown list.
4. If the specific event is not listed, then select Comment and type in your remark.
5. Click Done button, to accept annotation.
A1) 18.683 mins
Valve Opens (Unloading)
Tubing Pressure: 232.73
Casing Pressure: 259.30
Acoustic: 0.272989
A2) 30.700 mins
Liquid Arrives
Tubing Pressure: 115.99
Casing Pressure: 244.62
Acoustic: 3.535748
A3) 31.600 mins
Plunger Arrives
Tubing Pressure: 171.31
Casing Pressure: 244.15
Acoustic: 92.507614
A4) 39.583 mins
Valve Closes
Tubing Pressure: 118.67
Casing Pressure: 237.71
Acoustic: 2.803207
+ Add
X Delete
49


Annotation Options
Time Range: 86.7494 mins
Annotate from Field View shows all Traces.
Casing Pressure
Tubing Pressure
Tubing Acoustic
Defined Annotations:
(04:25:57 PM, 254.32)
(04:25:57 PM, 232.64)
(04:25:57 PM, 79.98)
260
240
220
200
180
160
140
120
A1
A2
A3
A4
A5
04:25:57 PM
04:37:03 PM
04:48:10 PM
04:59:17 PM
05:10:23 PM
05:21:30 PM
05:32:37 PM
05:43:43 PM
Elapsed Time
Changing Scroll Bar will ZOOM into the graph and aid in identifying specific events taking place during the plunger lift cycle, such as the exact time when the motor valve opens or closes, plunger starts to fall or gets stuck in the tubing, plunger reaches liquid or bottom, etc.
A1) 18.683 mins
Valve Opens (Unloading)
Tubing Pressure: 232.73
Casing Pressure: 259.30
Acoustic: 0.272989
A2) 30.700 mins
Liquid Arrives
Tubing Pressure: 115.99
Casing Pressure: 244.62
Acoustic: 3.535748
A3) 31.600 mins
Plunger Arrives
Tubing Pressure: 171.31
Casing Pressure: 244.15
Acoustic: 92.507614
A4) 39.583 mins
Valve Closes
Tubing Pressure: 118.67
Casing Pressure: 237.71
Acoustic: 2.803207
A5) 84.583 mins
50
Add
Delete

Click on the Stop button to terminate recording of plunger lift data. Click on Yes to Confirm.



Long Term Plunger Acquisition Test



Tubing:
WRFG 201

Casing:
WRFG
MAGSOL

Begin Time 08-06:15:53 PM | End Time 09-02:32:13 PM | Duration 20:16:20 | Sample Rate 30 hz

Selection: 1216.33 min

Casing Pressure — Tubing Pressure — Tubing Acoustic

250
200
150
100
50
0

Charlie Lambert A-760
10/08/2016

Elapsed Time 08-06:15:53 PM | 08-10:53:39 PM | 09-03:31:26 AM | 09-08:09:13 AM | 09-12:46:59 PM

Time 09-04:47:48 AM clock

Tubing: -0.350475 mV | 125.8 psi (g)

Casing: 1.209378 mV | 250.5 psi (g)

Annotations... | Export

Plunger Lift Data is Saved Every 5 Minutes to the Hard Disk. Max of 5 minutes Lost If Sensor Stops or TAM Prematurely Terminates.

Internal Lithium Batteries Acquire Data Continuously for Approximately 12 hrs

External Battery Can Significantly Extend Recording Time

Protect Wireless Sensors With a Weather Proof Covering

For Long Term Acquisition Protect Laptop and Base Station from Elements, Damage, & Theft

Deep Cycle Battery with Auto Adapter Keeps Laptop and Base Station Powered

USB Fan Dissipates Heat Generated by Laptop

TAM - Plunger Lift Seminar : Plunger_Normal Cycle

(((ECHOMETER)))

Alpha Jun 7 2017 14:46:57

Setup Hardware

F2

F10 Connect a Base to Acquire

TAM Help

Quick Reference Guides

- Well Analyzer Setup for LL sensors
- TAM Features
- Well Analyzer Setup for DYN sensors
- Liquid Level Features
- Wireless Setup
- Dynamometer Features
- Best Practices for Sensor Communication
- Using a Power Sensor in a Dyn Test
- Starting a Wired Liquid Level Test
- CBE Features
- Starting a Wireless Liquid Level Test
- Basic Steps to Track a Plunger - Wired
- Starting a Wired Dynamometer Test
- Basic Steps to Track a Plunger - Wireless
- Starting a Wireless Dynamometer PRT Test
- Plunger Lift Manual
- Starting a Wireless Dynamometer HT Test

Online Resources

View Echometer Online Support

Version Information

About TAM

Contact Echometer

Phone: (940) 767-4334
Fax: (940) 723-7507
Email: info@echometer.com

Echometer Company
5001 Ditto Lane
Wichita Falls, Texas 76302
U.S.A.

LL: 8723 ft

Production: 08/30/04
1 BOPD
1 BWPD

LL:08/30/04 11:10:49AM

Zoom | Edit

F11 History...

F12 Utilities

F1 Help

140
120
Time 09:10:20 AM

Time 09:56:34 AM clock

Annotations... | Export

Basic Steps to Track a Plunger_wireless.pdf - Adobe Acrobat Pro

File Edit View Window Help

Open | Create

1 / 9 | 157%

Basic Steps to Trac

Tracking Plunger Benefits

1. Tracking system minimizes the need for wire line.

2. A plunger can be dropped and tracked to the seat nipple or collar stop. The collars can be counted to be sure the plunger is at the seat nipple or bottom hole spring.

3. Save time by quickly identifying holes and eliminating the need to drop standing valve and pressure testing tubing before you pull it.

4. Quickly identify a spring or plunger that is not going to bottom.