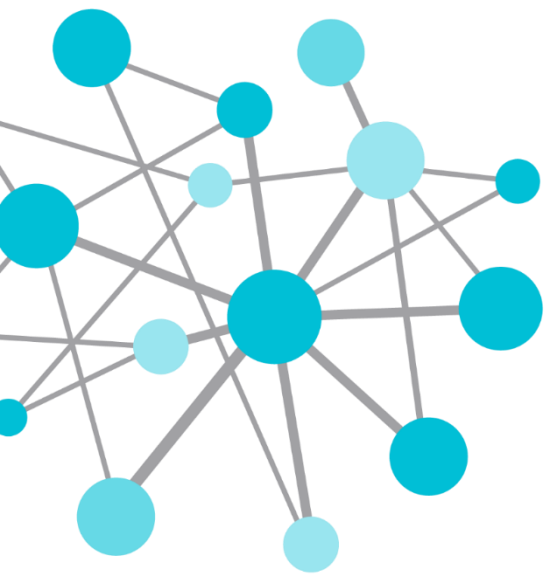


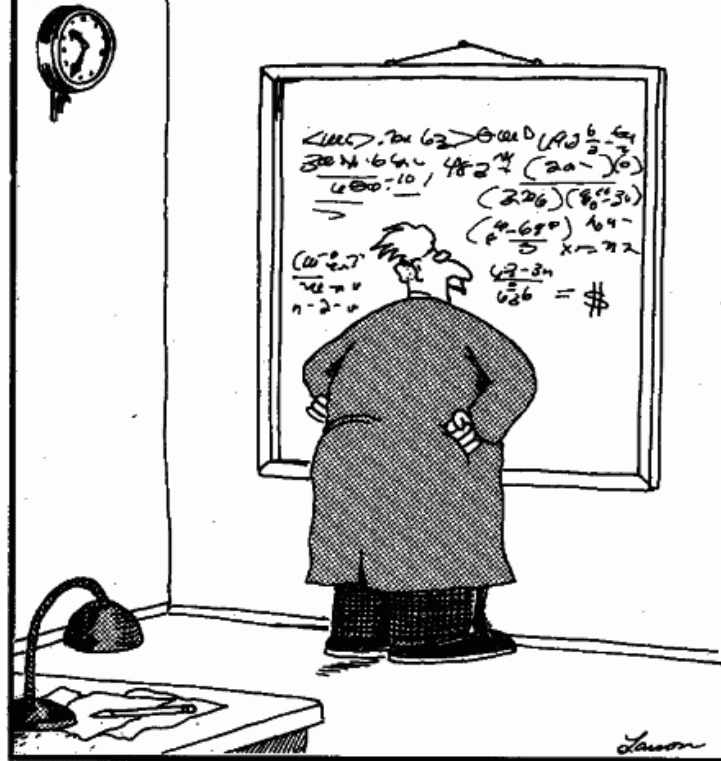


Troubleshooting Operational Aspects of Well Drilling and Completion Using the PI System

Presented by **Ales Soudek**
Yung Wallace



1985



Einstein discovers that time is actually money.

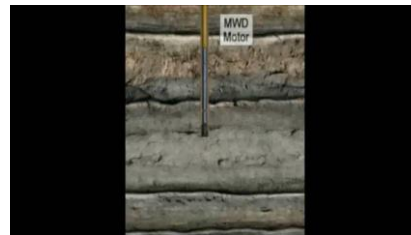
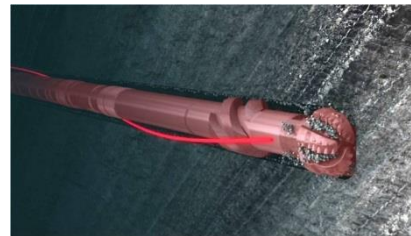
Business Challenge

- High Cost - \$80,000/d to \$1,000,000/d
- Reduce Drilling/Completion Days
 - Drilling – 20 to 25 days
 - Completion – 50 to 70 days
- Current focus – Depth Based Analysis
- Compare Shifts, Crews, Drilling Outfits
- Noise in the Data



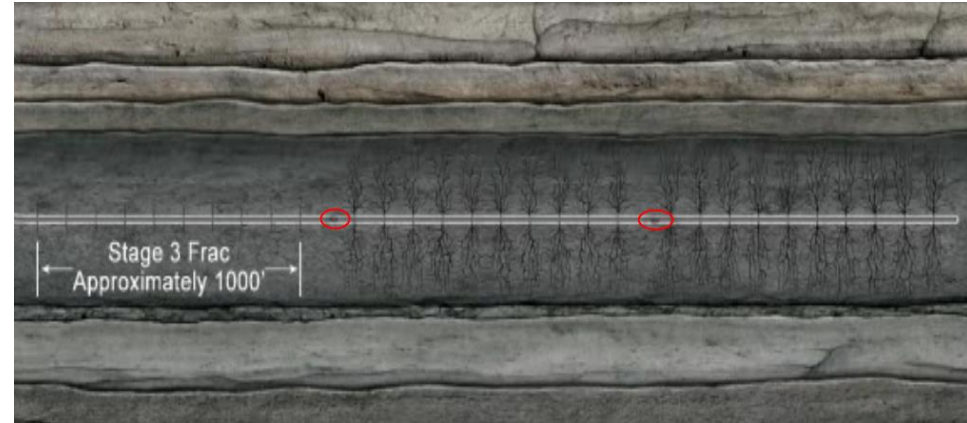
Background and Terminology

- Stick-Slip →
- Rotating Drilling ↘
- Sliding ↘
- Tripping In/Out
- On/Off Bottom
- Other Types of Events ...



Completion - Fracking

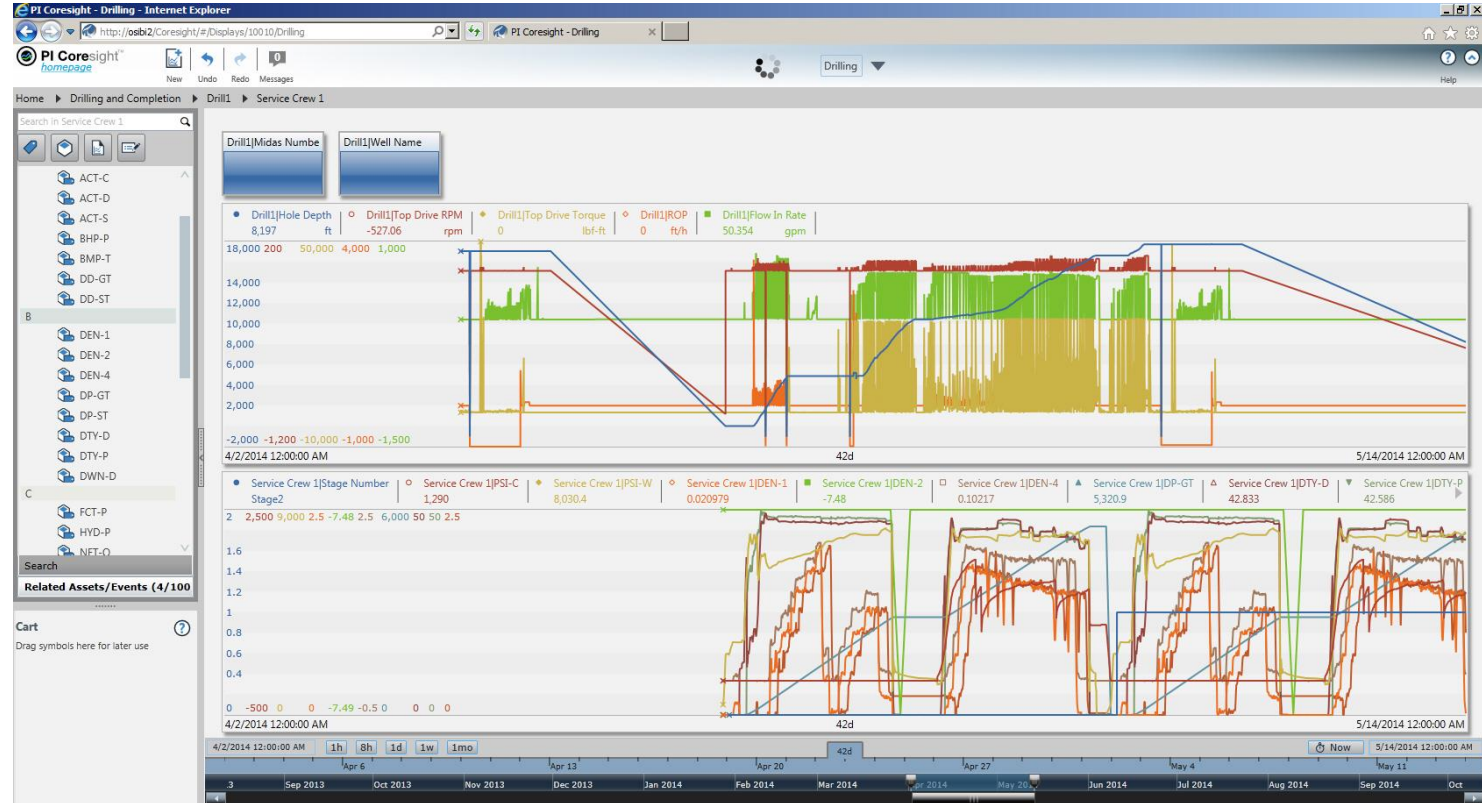
- Process
 - Blast
 - High Pressure Fluid
 - Plug
- Stages
 - Typically 1000 ft



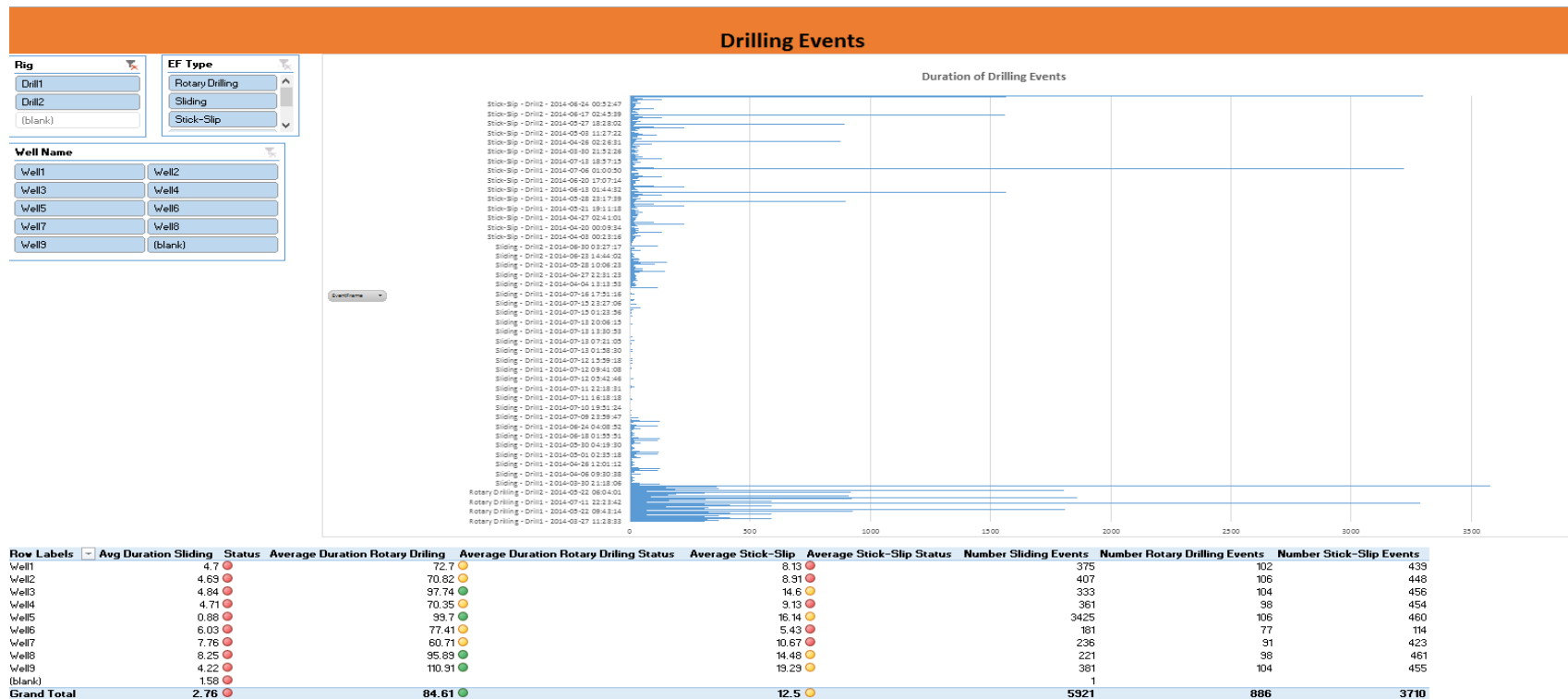
Results

- Analyzing Results
 - PI Coresight
 - Microsoft PowerView
 - PI DataLink

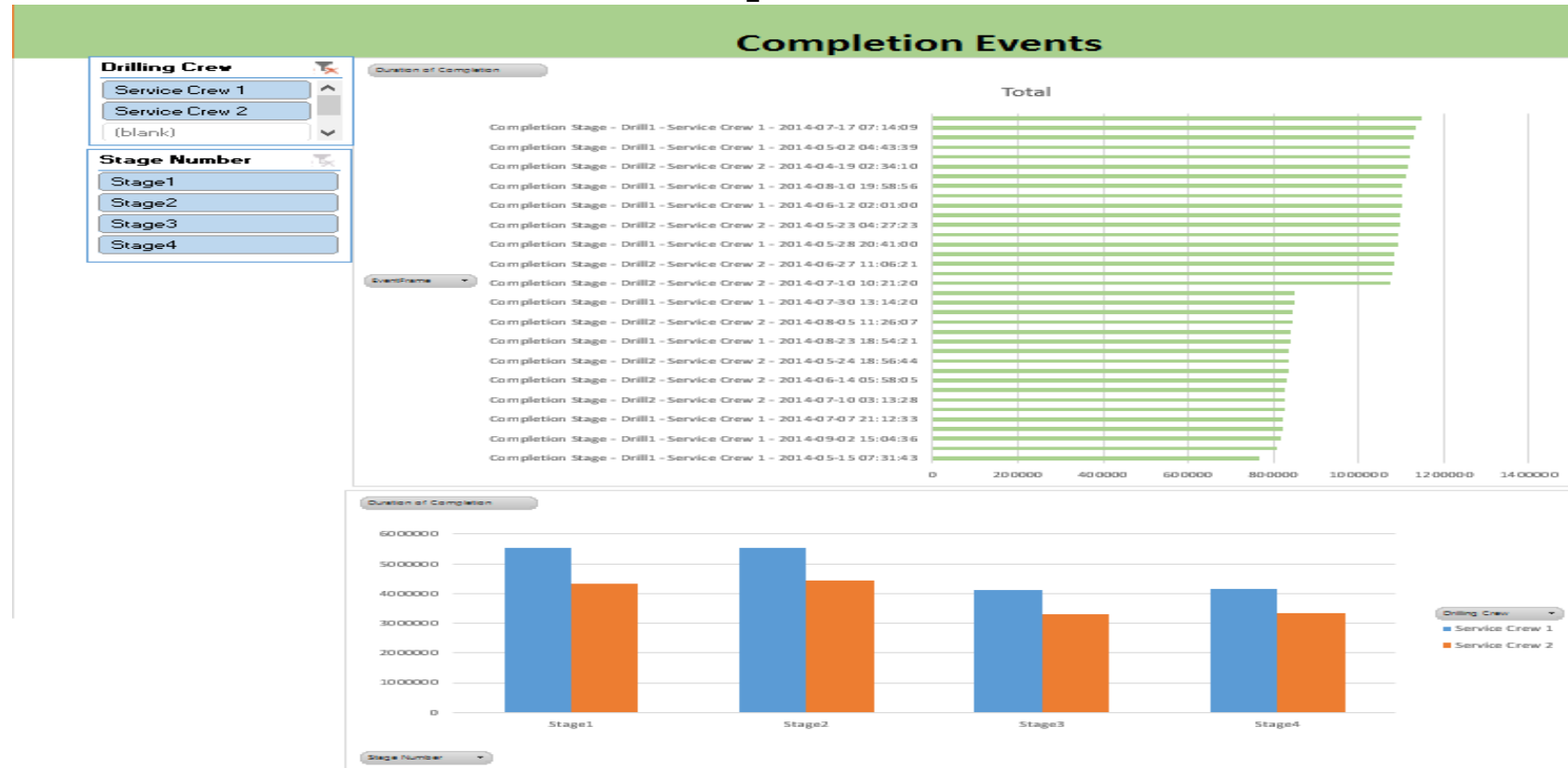
PI Coresight



Overview of Drilling Events



Overview of Completion Events

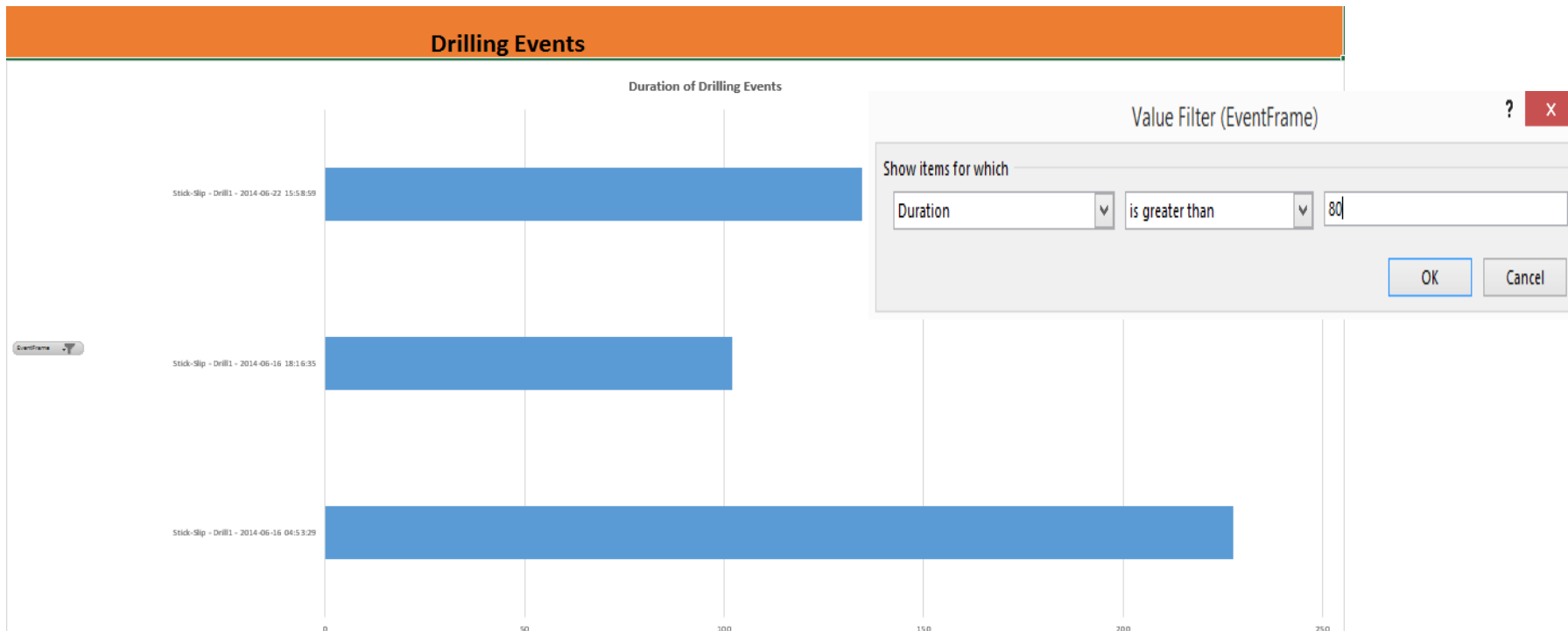


Drilling Event – Ad hoc Analysis

Drilling Events

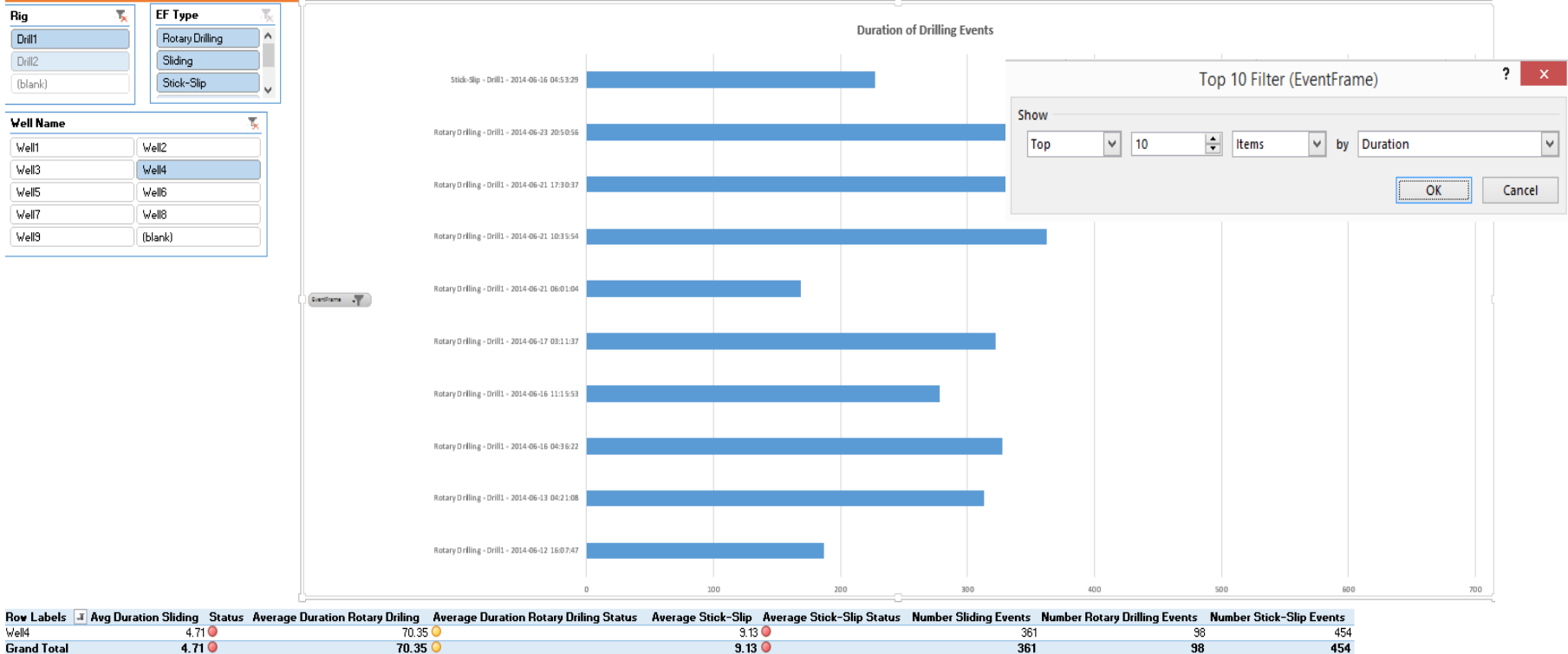


Drilling Event – Search based on Duration

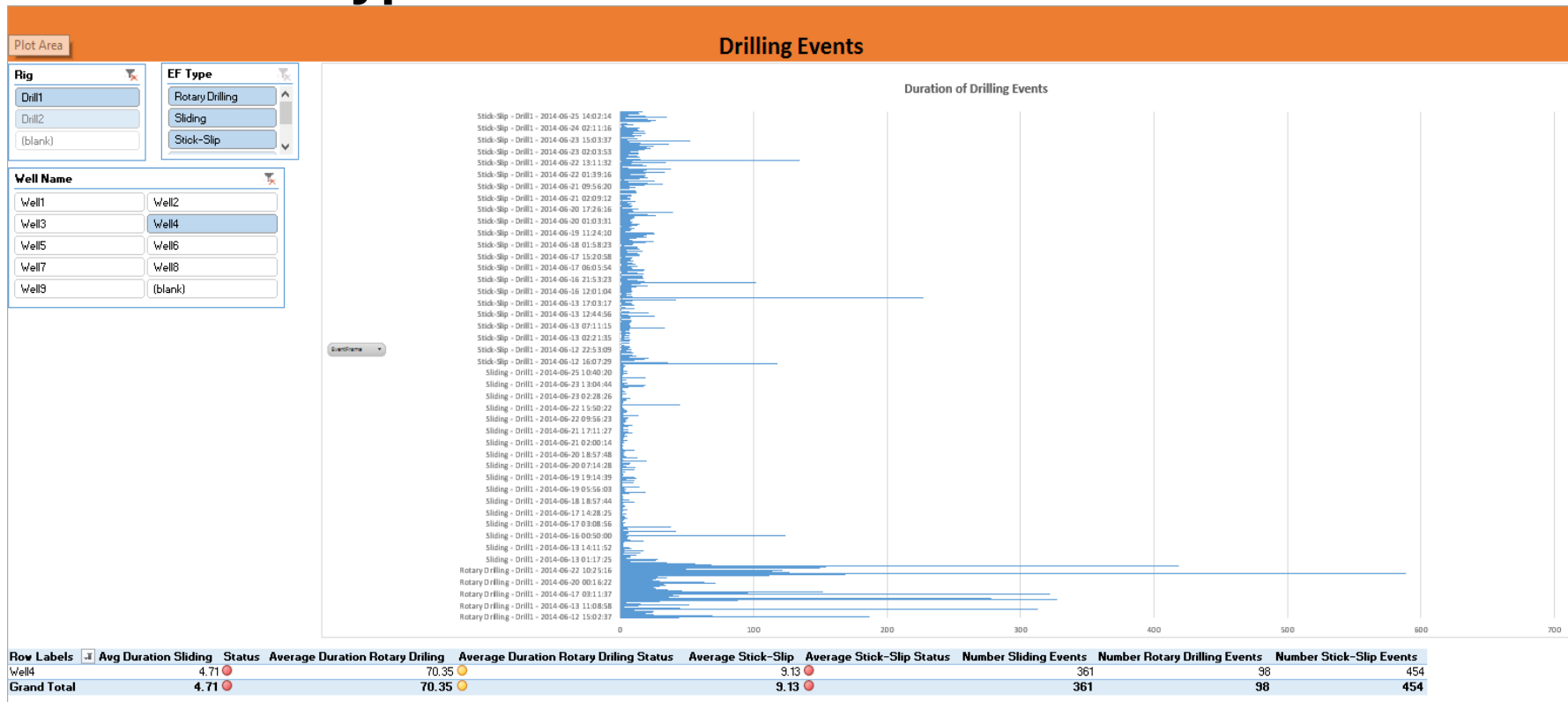


Drilling Event – Search based on top 10 events

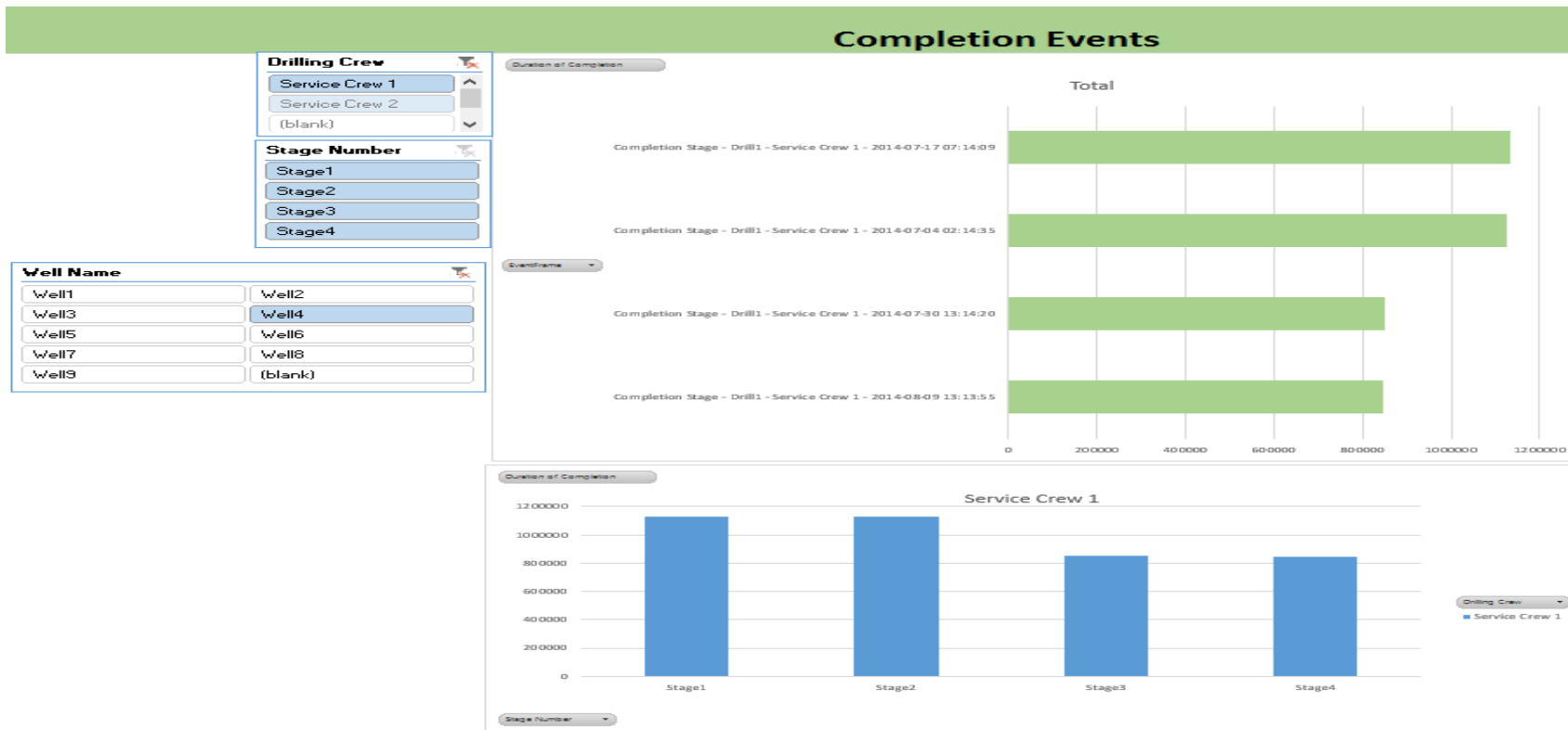
Drilling Events



Drilling Event – Calculate the average duration for each event type



Completion Event – Search for completion events on a Well



PI DataLink

Sample Drilling Report

	A	B	C	D	E	F	G	H	I
1									
2									
3	Start Time	*-500d							
4	End Time	*							
5	EF Type	Stick-Slip							
6	Well Name	Well3							
7	Duration		5						
8									
9									
10									
11	Event name	Start time	End time	Duration	Event template	Primary element	EF Type	Drilling	
12	Stick-Slip - Drill1 - 2014-06-03 16:01:	03-Jun-14 16:01:15	05-Jun-14 23:02:27	2 7:01:12	Stick-Slip	Drill1	Stick-Slip	Service Crev Sti	
13	Stick-Slip - Drill1 - 2014-06-02 00:48:	02-Jun-14 00:48:27	03-Jun-14 02:55:19	1 2:06:52	Stick-Slip	Drill1	Stick-Slip	Service Crev Sti	
14	Stick-Slip - Drill1 - 2014-05-26 21:39:	26-May-14 21:39:18	27-May-14 12:35:38	0 14:56:20	Stick-Slip	Drill1	Stick-Slip	Service Crev Sti	
15	Stick-Slip - Drill1 - 2014-05-22 14:31:	22-May-14 14:31:13	24-May-14 20:07:28	2 5:36:15	Stick-Slip	Drill1	Stick-Slip	Service Crev Sti	
16									
17									

Explore Events

Database

\NOSIB13\Calgary Seminar 2014

Search start

'Raws'\SB\$3

Search end

'Raws'\SB\$4

☐ Limit to database level

More search options

Event category

*

Minimum duration

'Raws'\SB\$7

Maximum duration

Event name

*

Event template

Stick-Slip

Element name

*

Element template

*

Search mode

active in range

Sort order

start time ascending

Attribute value filters

Attribute	Operator	Value
EF Type	=	'Raws'\SB\$5
Well Name	=	'Raws'\SB\$6

Future Plans

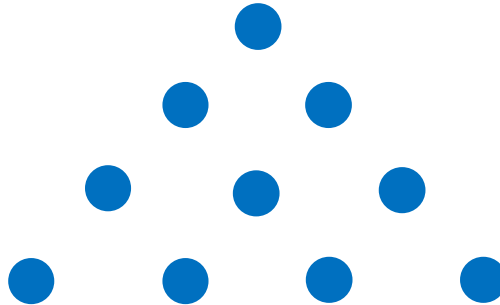
- Expand PI Event Frames Template
- Expand Analyses
- Create Performance KPIs

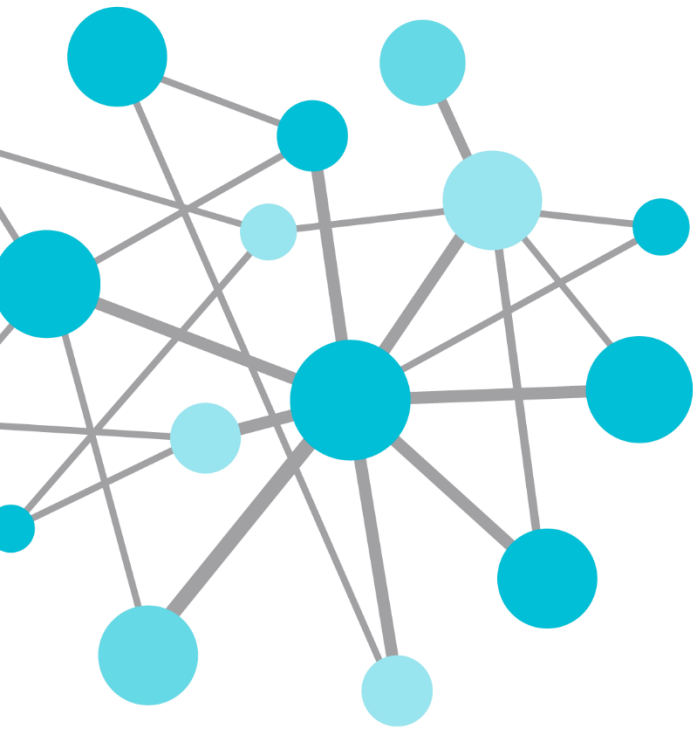
Conclusion

- Ability to Analyze Operations
 - Event Frames
 - Analytics
 - BI Tools
- Shorten time for Drilling and Completions

Yearly Puzzle

“Move 3 dots to turn the triangle upside down.”



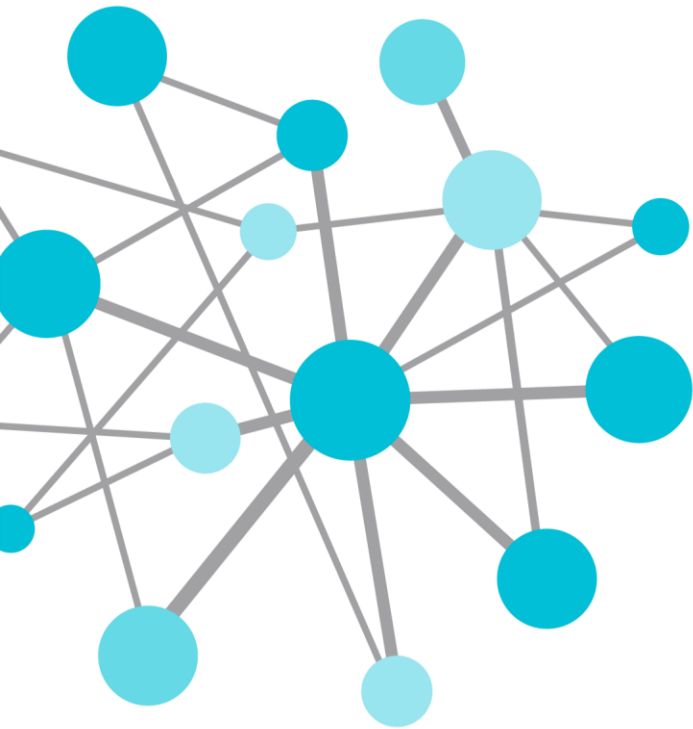


Questions

**Please wait for the
microphone** before
asking your question



**Please state your name
and your company**



THANK
YOU

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