



OSIsoft®

O&G Industry Use Cases

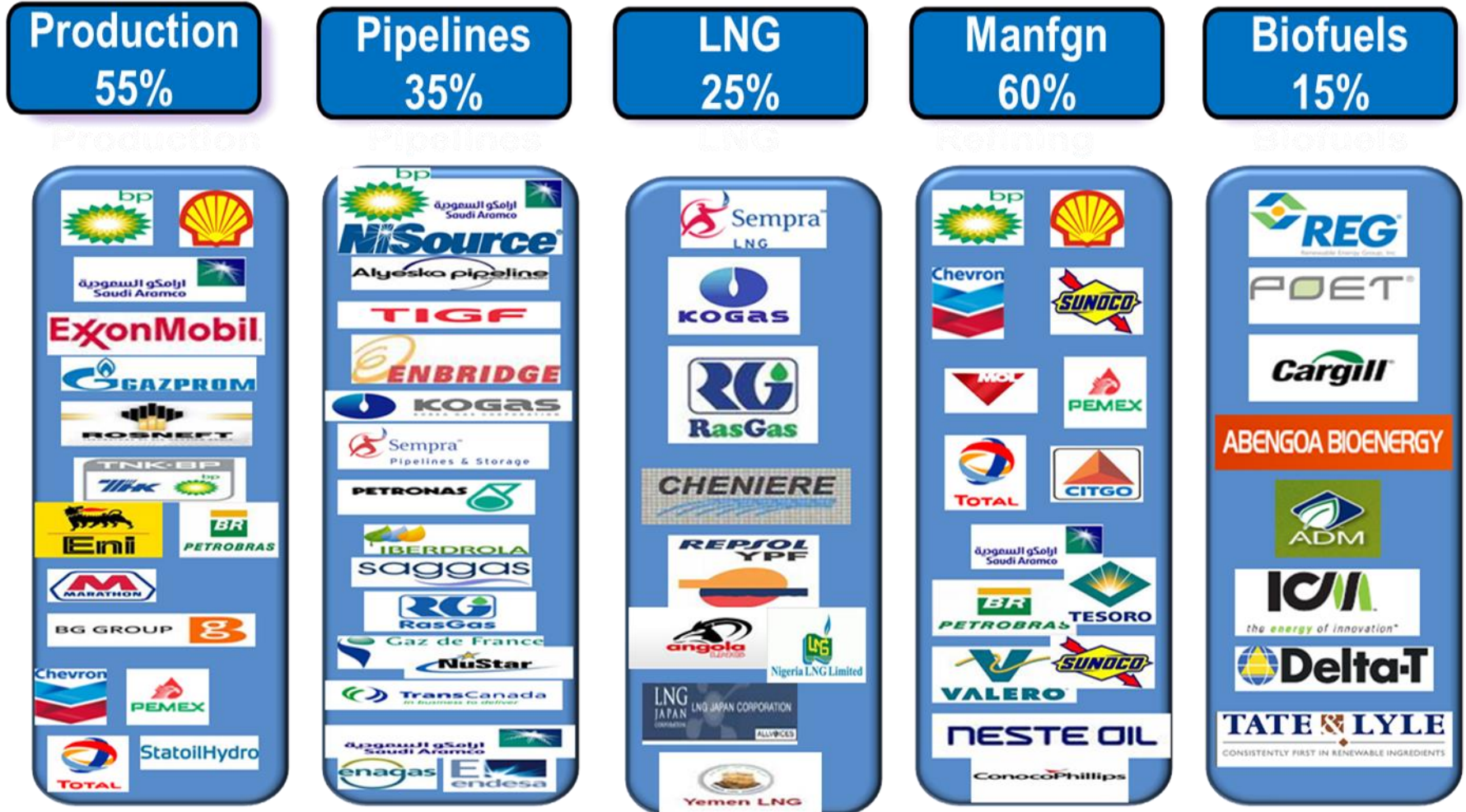
Presented by **Michael Graves, Industry Principal**

Agenda

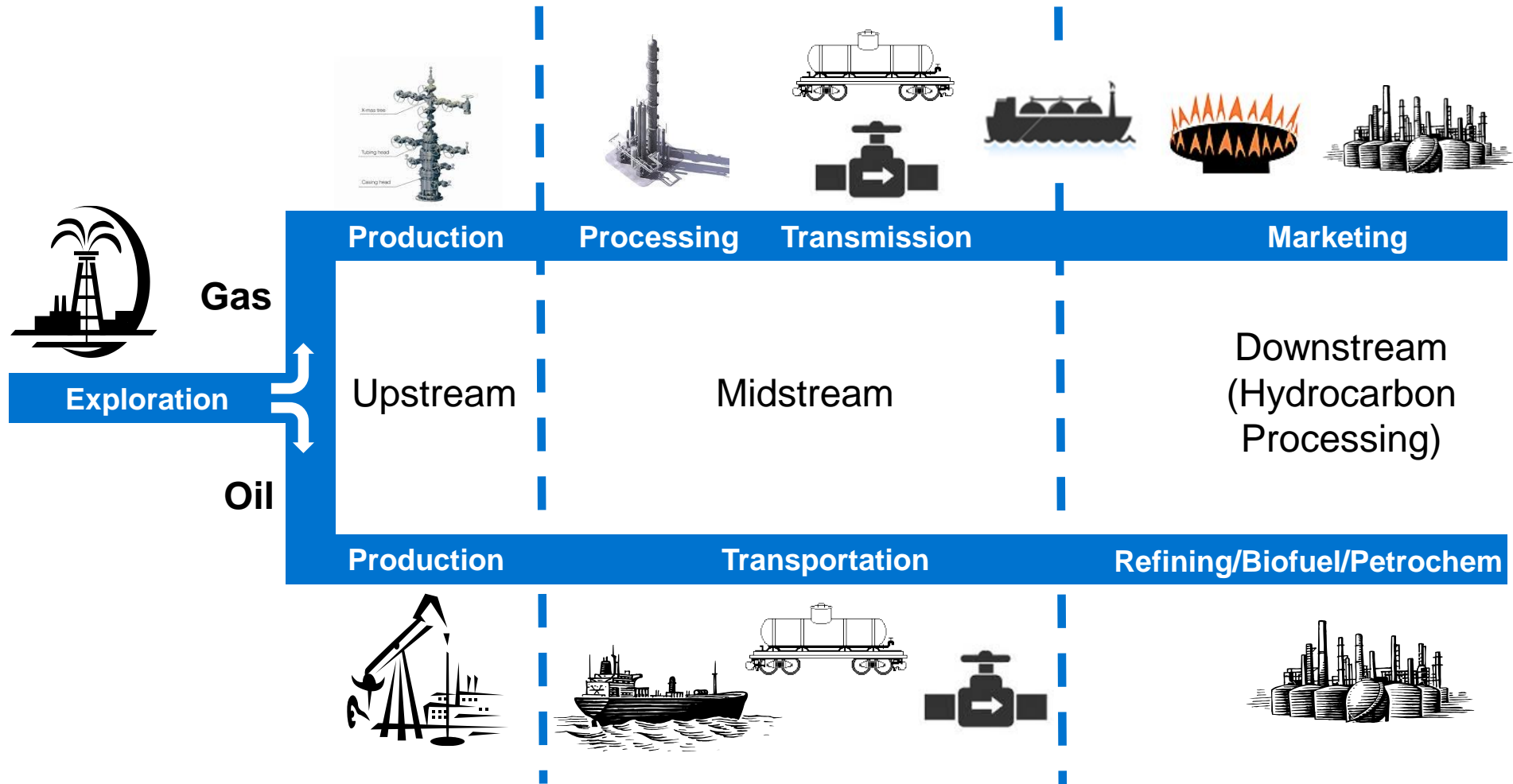
- Industry Overview
- Use Cases
 - Upstream
 - Midstream
 - Downstream
- Q&A

The Standard in Oil and Gas

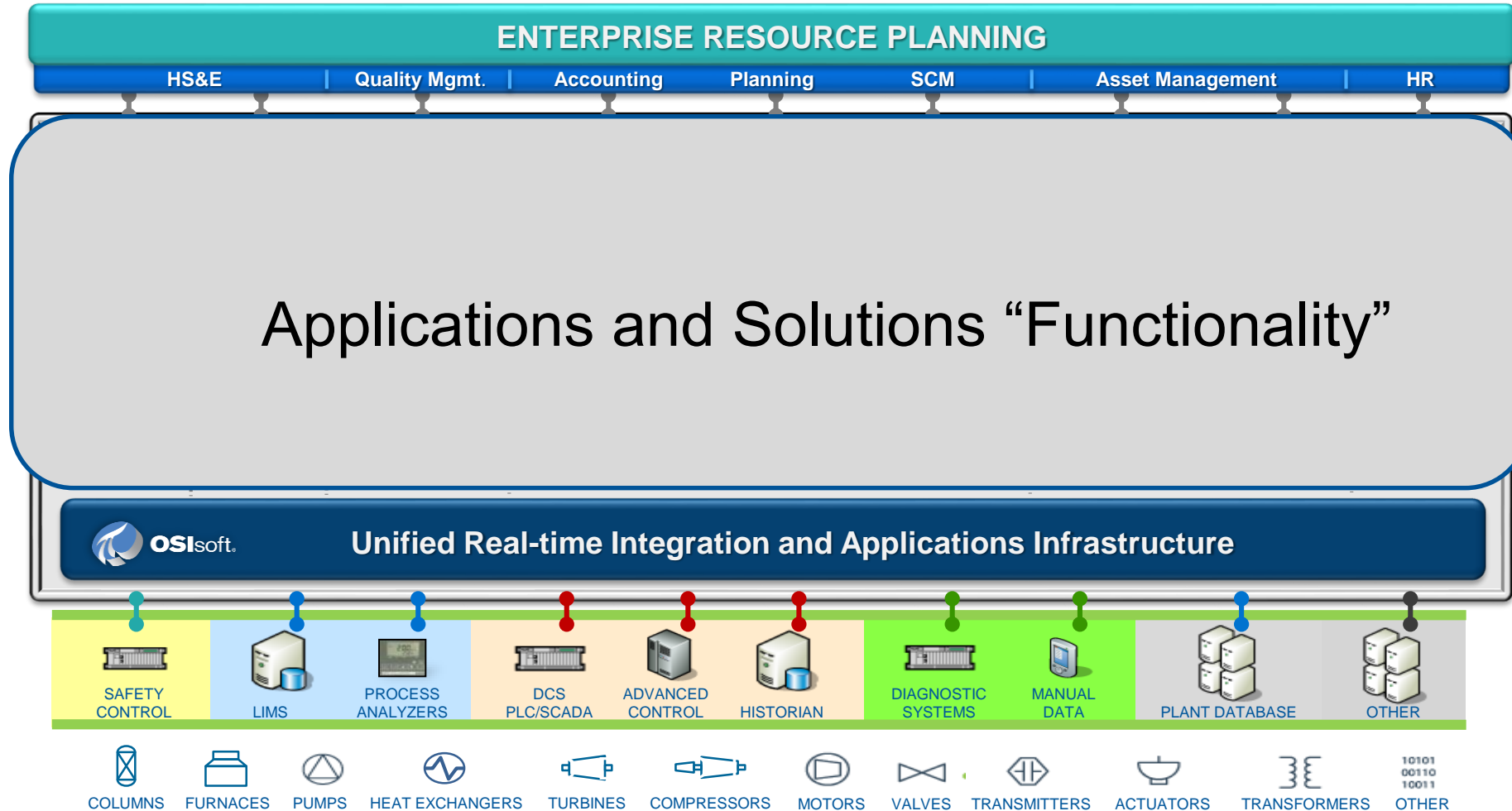
Percent of Global Capacity Using The PI System



Oil and Gas Industry View



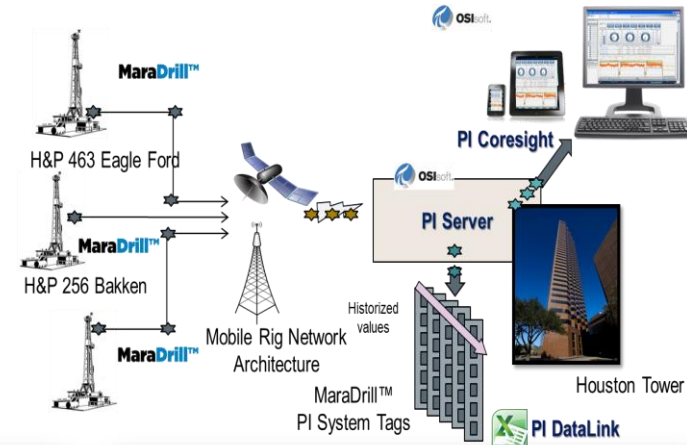
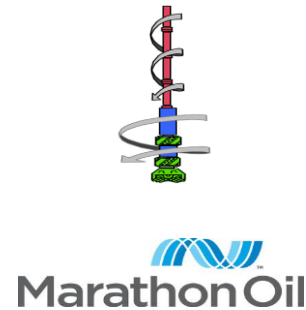
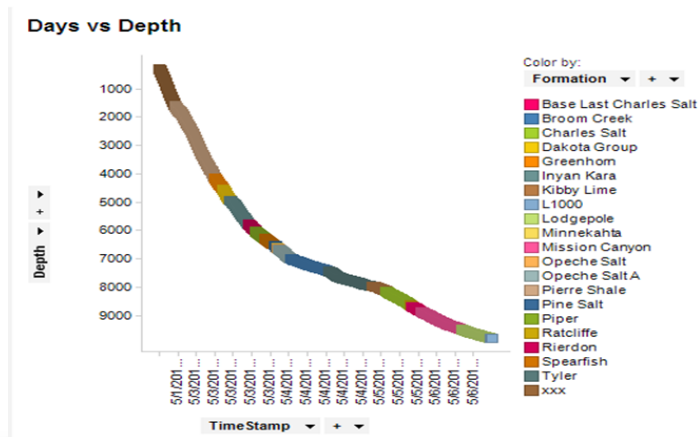
PI System enables IT/OT Convergence



Use Cases

Upstream

Real-Time Drilling Optimization Reduces Drilling Time and Associated Resources Usage



Customer Business Challenge

Lack of real-time drilling analytics and guidance capability at the drill site

Extended drill time and down hole tool damage

Increased use of resources

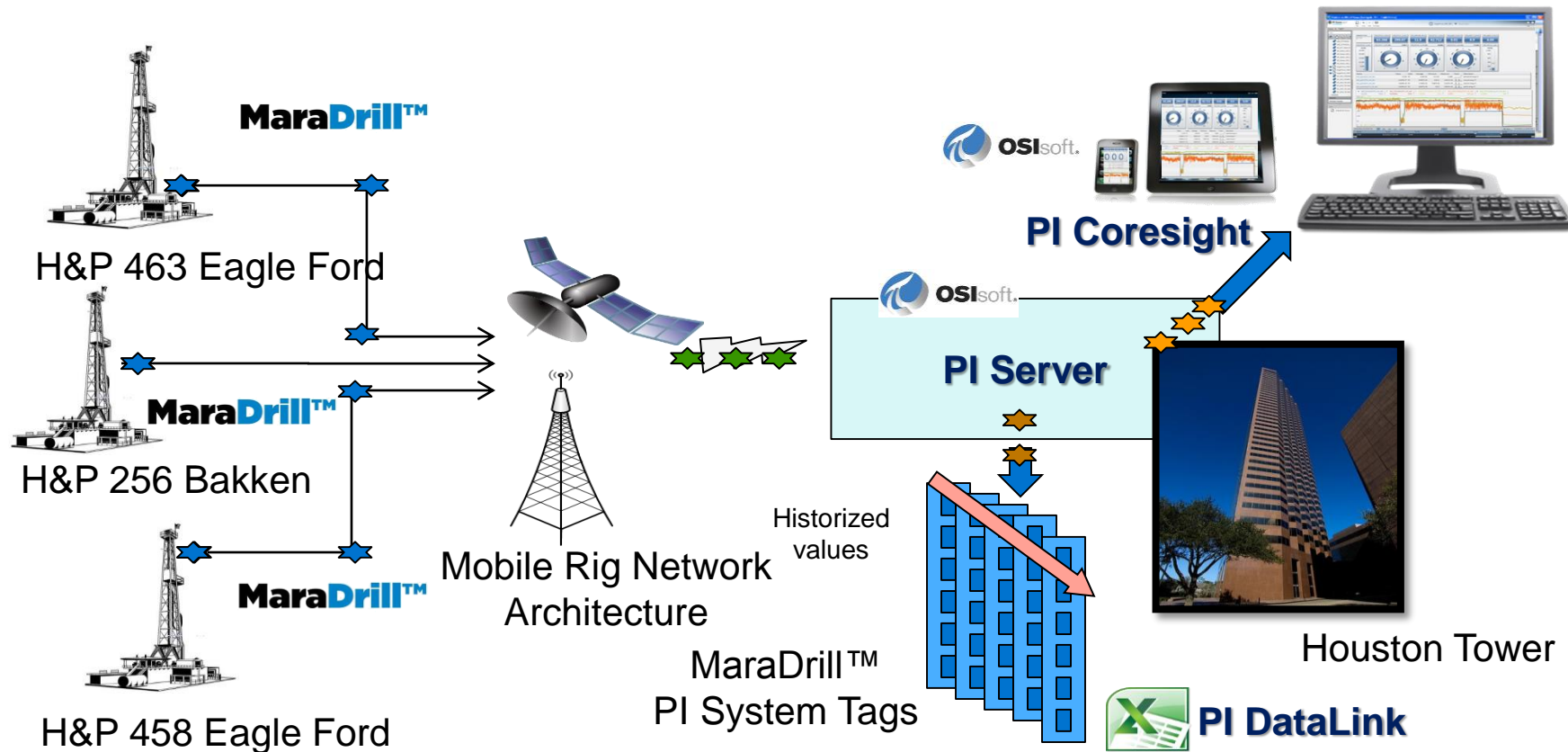
Solution

- Installation of the PI System real-time integration and applications infrastructure
- Creation of drilling process high fidelity real-time analytics and visualization capabilities at the drill site

Customer Results / Benefits

- Drilling time and capital well cost savings including reduction in resources
- Reduced vibration and damage to downhole tools
- Continuous optimization onsite and retrospective post-well analysis

High Fidelity Data Between the Drill Site and the Corporate Support Center Enables Improved Drilling

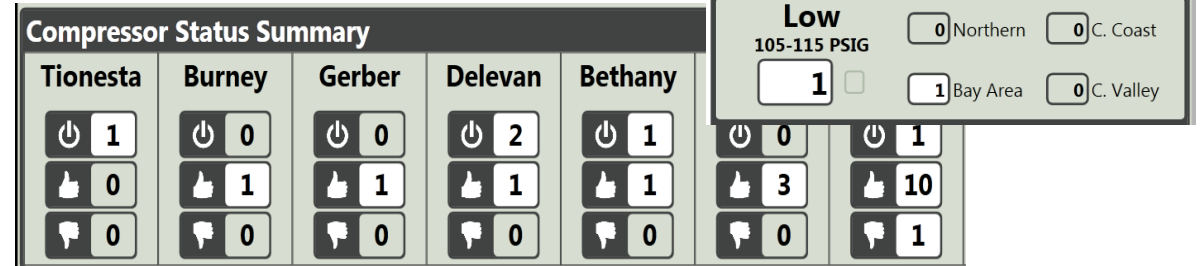


Midstream

Predictive and Proactive

"Implementation of the PI System has enabled the transformation of PG&E's ability to provide safe and reliable gas T&D to our customers. We now have proactive alarm management and enhanced visualization, collaboration, and an crisis management capability. The PI System has provided significant benefits and value.

Sr. Consulting Engr, PG&E



Customer Business Challenge

- Mandated Implementation of NTSB and PHMSA 49 CFR 192 to address findings of gas explosion 9/9/2010
- Large gas T&D network
 - 4.2 million customers
 - 6,500 miles transmission
 - 43,000 miles distribution
 - 4500 RTUs
- Diversity of systems, no integration
- No collaboration, proactive CBM alarm management, or collaboration

Solution

- Used the PI System as areal-time data integration & application infrastructure
- Used PI AF for:
 - Advanced alarm management and notification
 - Critical asset CBM
 - Collaboration, visualization, & mobility foundation
- 250 automated shut off values
- Gas Distribution Control Center

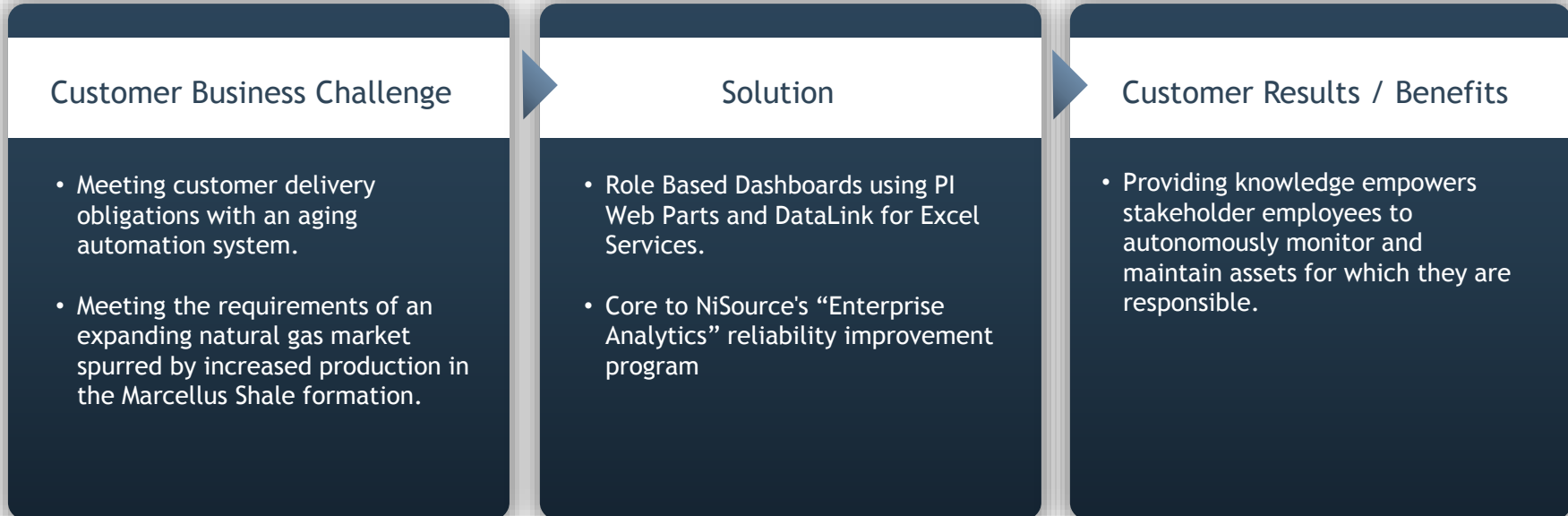
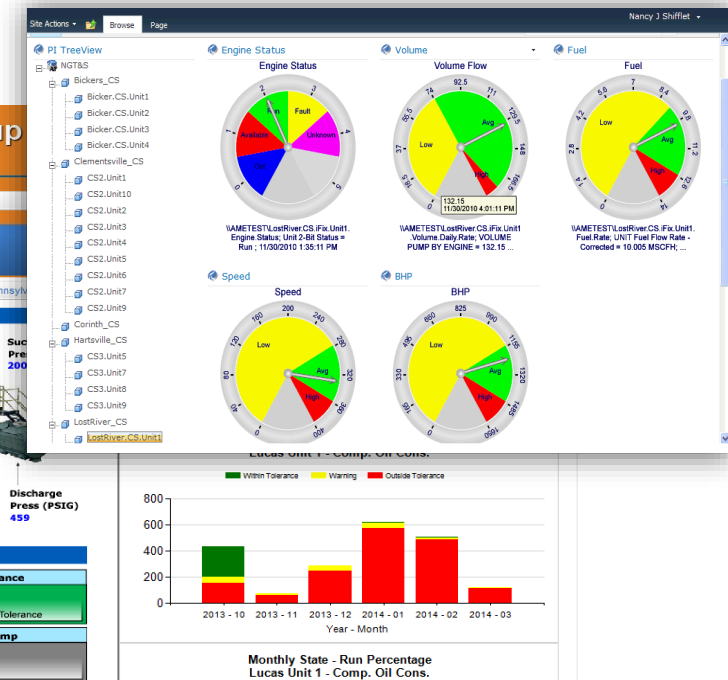
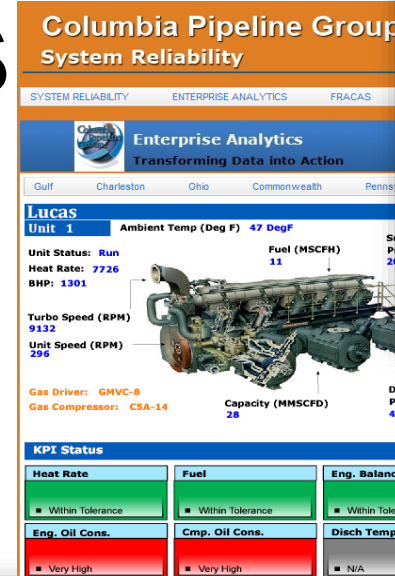
Customer Results / Benefits

- Improved alarm management, response, and crisis management capability
- Significantly improved real-time situational awareness, visualization, and collaboration
- Increased visibility into Gas Operations
- Safer, more reliable gas T&D operations

Improved Awareness

“To meet the needs of the customers and maintain total system awareness of the entire transmission and storage process, NGT&S is changing the way we think about data; data becoming information; and information becoming actionable knowledge.”

John Cox,
Reliability Engineer, NiSource



Downstream

Improving Refinery Performance & Optimization

“We don’t have to run faster than the bear...we just have to outrun the other guy...”

Anonymous



Unit: Coker Optimization Page
Date: 3/27/2013 5:24:00 PM

Description	27 Total Days		Today	Yesterday	Month To Date	Min Day	Max Day	3/27/2013			Comments	Notes
	Tag Days in Each Color	Current Value						3/27/13	3/26/13	3/27/13		
Coker Feed Circuit												
Coker Feed 114002_001	0	4.5	100%	4.8	100%	100%	100%	3.2	3.5	7.6	8.0	114002_001
Coker Feed 114002_002	0	25.6	100%	25.3	99%	100%	100%	28.0	29.0	29.0	29.0	114002_002
Coker Feed 114002_003	0	29.6	100%	29.6	100%	100%	100%	29.6	29.6	29.6	29.6	114002_003
Coker Feed Temp 114001 & 114002	0	337	100%	337	93%	100%	100%	300	300	350	350	114002_003
Coker Heater Circuit												
Heater Charge Temp 111205	0	582	100%	568	83%	100%	100%	545	550			111205
Heater Outlet Temp 114001	0	812	100%	813	85%	100%	100%	800	800	825	825	114001
Heater Duty 111205	0	226	100%	243	100%	100%	100%	285	285	291	291	111205
Heater Q1 West 114114	0	2.5	100%	2.5	81%	100%	100%	0.5	0.8	3.5	3.5	114114
Heater Q2 West 114114a	0	2.2	100%	2.4	81%	100%	100%	0.5	0.8	3.5	3.5	114114a
Heater Q3 East 114114b	0	2.2	100%	2.4	81%	100%	100%	0.5	0.8	3.5	3.5	114114b
Heater Q4 East 114114c	0	2.2	100%	2.4	81%	100%	100%	0.5	0.8	3.5	3.5	114114c
Coker Drains												
Live Drum Pressure 114001	0	Failed	0%	-999.9	0%	0%	0%			40	42	114001
Drum Vapor Line post-Quench Temp 114001	0	791	100%	772	83%	100%	100%	720	750	800	810	114001
Coker Fractionation Limits												
Fractionator On Temp 112055	0	219	87%	228	85%	100%	100%	200	225	270	285	112055
Fractionator On Res. Temp 114141	0	112	100%	120	96%	100%	100%	100	110	170	200	114141
Fractionator On Pressure 114007	0	26.0	100%	18.1	70%	100%	100%			20	25	114007
Coker Kerosene Draw Temp 112271	0	364	100%	370	95%	100%	100%	345	345	400	400	112271
LOGO Draw Temperature 112272	0	484	100%	482	83%	100%	100%	440	440	505	505	112272
LOGO On Flow 114005_001	0	442	100%	429	84%	100%	100%	375	380	450	450	114005_001
LOGO Draw Temperature 11265	0	637	100%	634	85%	100%	100%	610	610	675	675	11265
Coker Gas/Oil												
Stripper Bottoms Temperature 11205	0	295	100%	295	80%	100%	100%	292	292	310	312	11205
Storage Absorber Pressure 112113	0	102	100%	106	74%	100%	100%	100	100	210	215	112113
HighPur Lean Oil Flow 112115	0	11.5	100%	10.5	90%	100%	100%	6.0	6.5	12.5	13.0	112115
#1 Flat Drump Oil to Coker	0	397	100%	400	100%	100%	100%	390	390	1000	1000	112115
Stripper Oil to Coker	0	691	100%	680	97%	100%	100%	660	660	2000	2000	112115
Coker Kerosene - Lean Storage Oil Flow 112118	0	9.5	100%	9.5	95%	100%	100%	5	6	10.5	10.5	112118
Storage Oil Gas Content 114002_001	0	5.24	100%	3.79	81%	100%	100%	5	6	4.0	5.0	114002_001
Percentages	0	94%	94%	94%	94%	94%	94%					94%

Customer Business Challenge

- No integration of real-time data to Planning & Scheduling and Optimization models
 - Need to Optimize Process and view results in real time
- Lack of collaboration, visibility, and KPIs with high fidelity drill down capability
- Issues with Refinery performance

Solution

- Installation of the PI System
- Integration of data sources
- Data quality validation
- Use of PI-PE and PI-ACE to generate data sets to models
- Use of PI-Webparts for collaboration and visualization

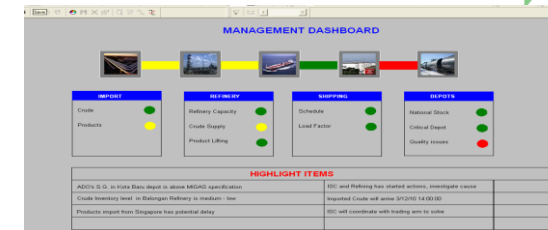
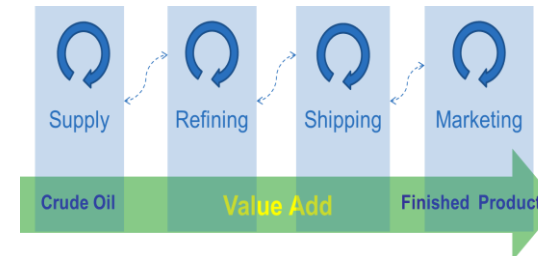
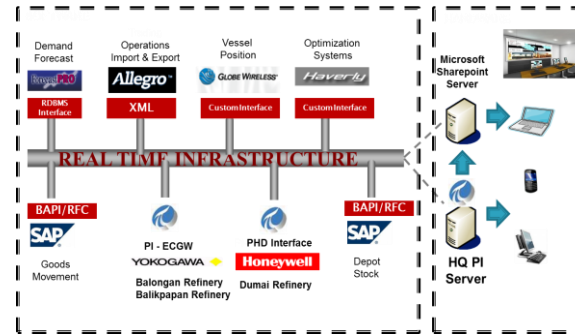
Customer Results / Benefits

- Near real-time” asset, unit, and refinery optimization
- Step change in refinery performance - proactive vs reactive culture
- “One version of the Truth” - collaboration, accountability

Integrated Downstream Dashboard - A Real-Time Coherent View from Crude Source to Product Distribution

“Using the PI System to integrate our entire fuels value chain has transformed our significantly improved our performance and profitability. Time does matter.”

Toto Nugroho Pranatyasto
Pertamina



Customer Business Challenge

- No integration of applications and solutions across the fuels value chain
- Different values for critical data - no single version of the truth
- No collaboration or alignment of the 4 groups in the organization
- Issues with stock outs, high demerge, high training cost, poor performance

Solution

- Installed the PI System
- Migrated or integrated all downstream solutions into a common PI System infrastructure
- Common analytics, visualization, and collaboration
- Central operations center that enabled alignment of the 4 groups

Customer Results / Benefits

- National stocks maintained at optimal level
- Reduced Critical Depots (stock outs) by 60%
- Reduced Demurrage by 40 %
- Better loss monitoring & control
- Overall savings “10s of Millions”

Questions & Answers



Thank you

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