PIMSOFT
INNOVATIVE SOLUTIONS

PI System: A Prime Channel for Sigmafine Data Across the Enterprise

OSIsoft.

… when Data Quality matters in Process & Manufacturing

Ales Soudek, Global Solutions Group, OSIsoft

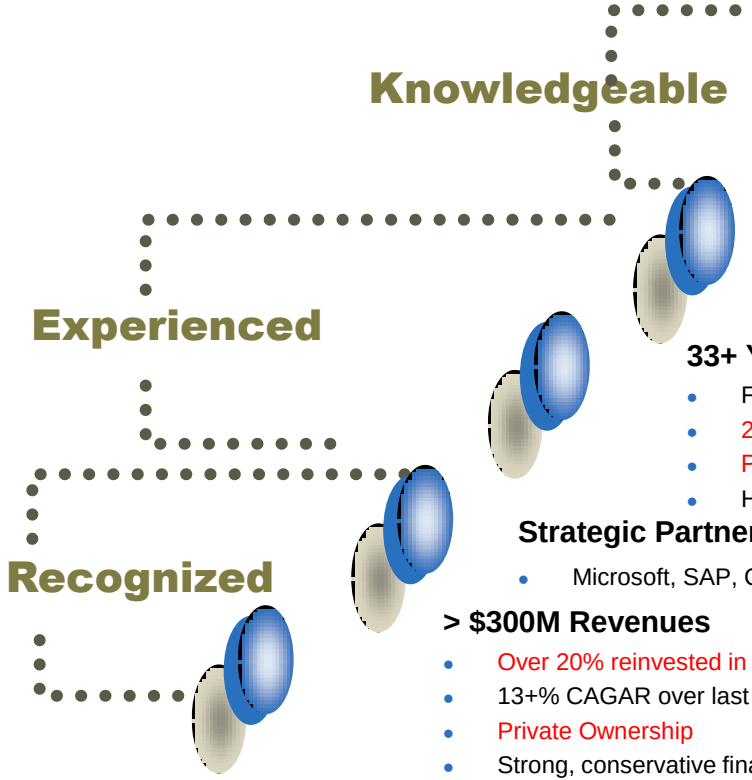
SIGMAFINE™ UM 2014
Houston TX – Oct 21-22
Shaping Data for Action

Agenda

1. Brief Overview of OSIsoft and the PI System
2. PI System Coverage & use in O&G and LNG
3. Value for Leveraging the PI System & Sigmafine
4. Illustrative Examples
5. Concluding Remarks

A Validation of Delivering Business Value

2,800+ Customers,
114+ Countries



Global leader in Operational Intelligence

16,000+ Customer Installations

- **65% of Global 500** process and manufacturing companies
- 32,000+ interfaces, 300,000,000+ data streams
- 110+ EA customers, 600+ systems, 800 PI Servers managed

33+ Year History

- Founded 1980, 1000+ professionals
- 250 Product Developers/engineering, 325 customer support
- Product Business model, leverage SIs, “value out of the box”, focused
- HQ San Leandro, CA

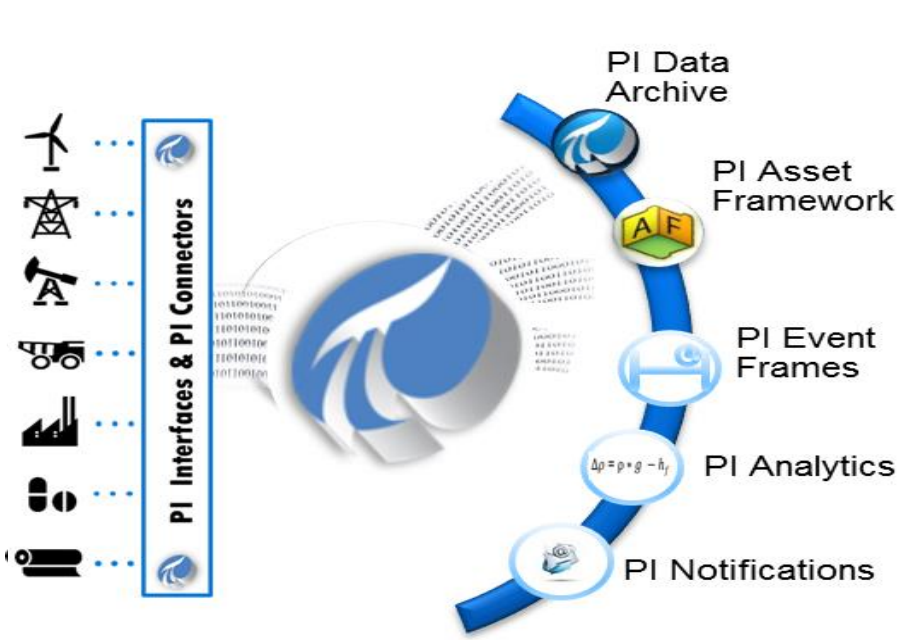
Strategic Partnerships

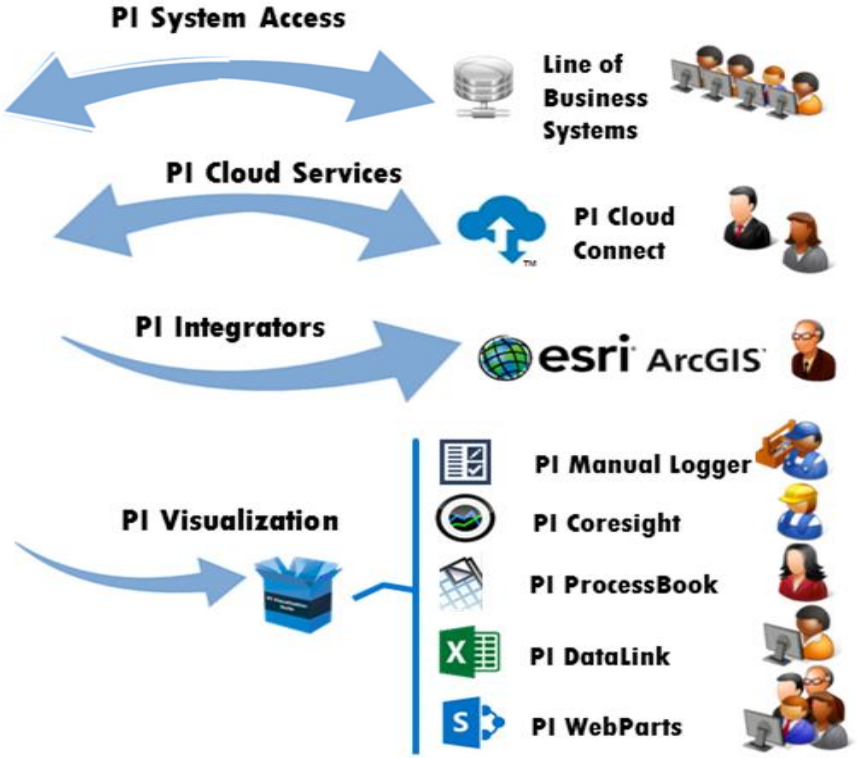
- Microsoft, SAP, Cisco, ESRI, Rockwell

> $300M Revenues

- Over 20% reinvested in R&D
- 13+% CAGAR over last 10 years
- Private Ownership
- Strong, conservative financial position

Key Elements of the PI System – A Data Infrastructure





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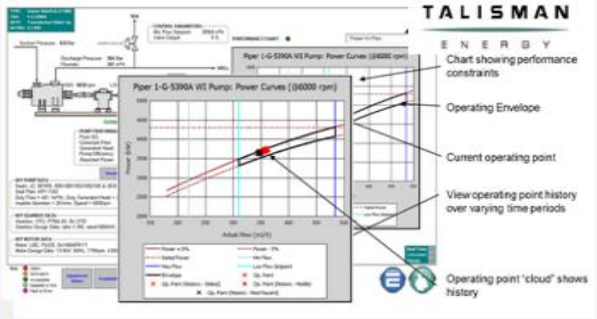
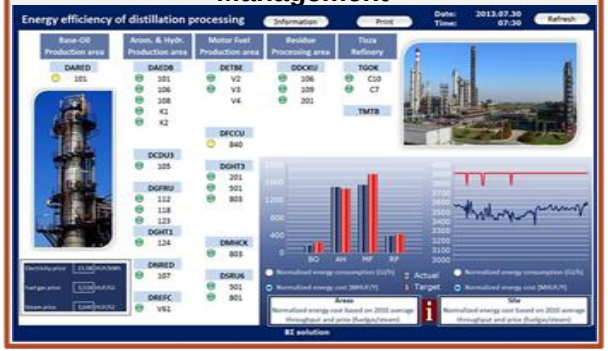
Enabling Op Ex in Hydrocarbon Processing

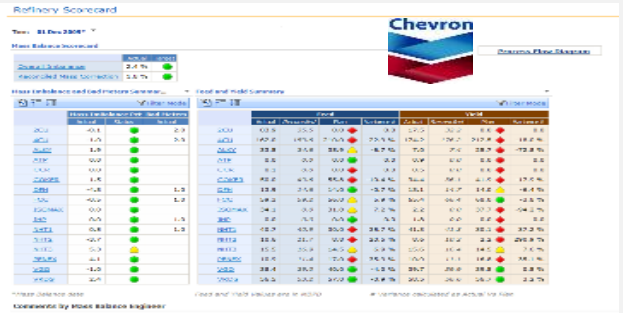
Asset Performance, Reliability, & Portfolio Management - CBM



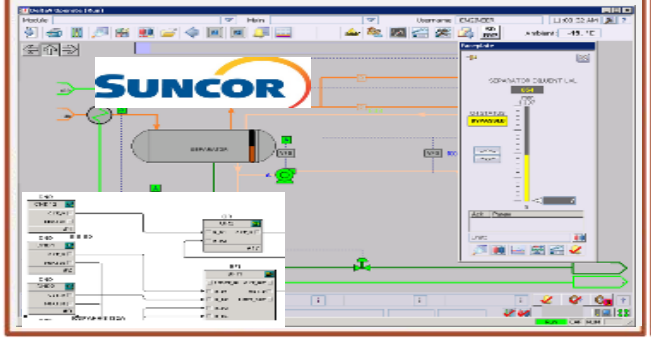
Environmental, Energy & Utilities Management



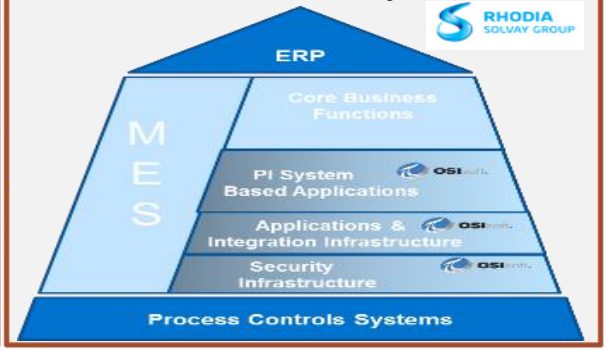
Ops Visibility, Reporting & Analytics, YA, "live" KPIs, & Model Based PvA



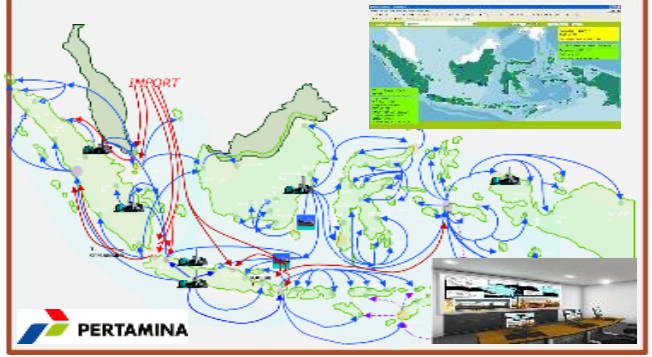
Safety & Reactive/Proactive Integrity Management



Infrastructure for MES MES AND The PI System

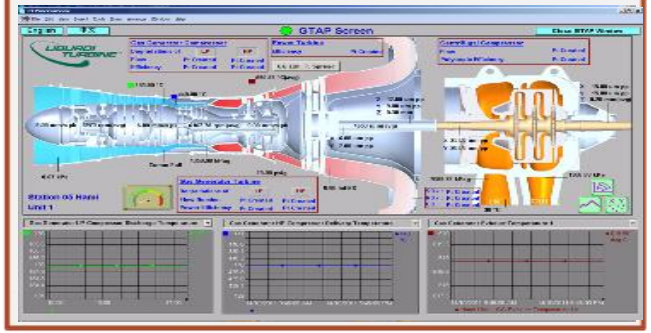


Value Chain Integration & Real-time Situational Awareness

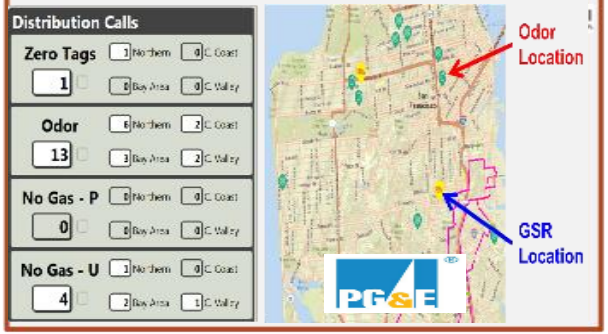


Enabling Op Ex in All Areas of O&G Logistics

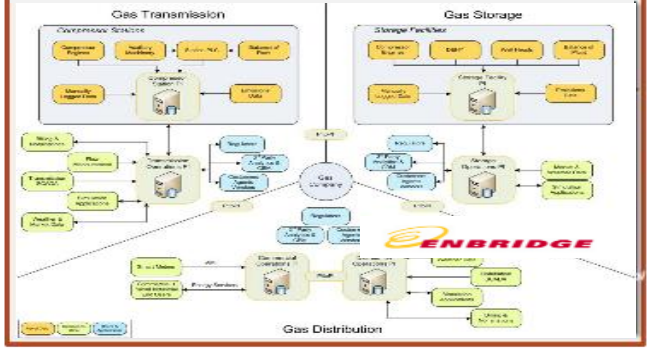
Asset Performance, Reliability, & Portfolio Management



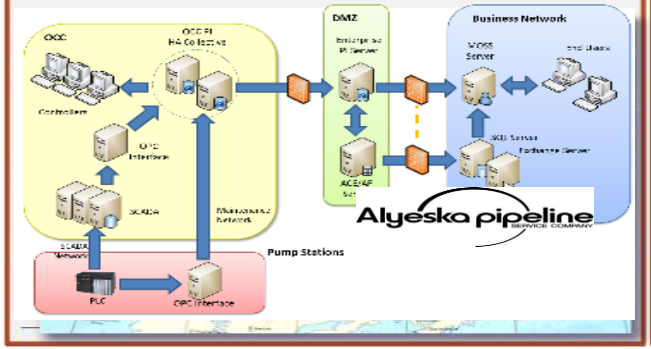
Geospatial Integration "Real-Time & Space"



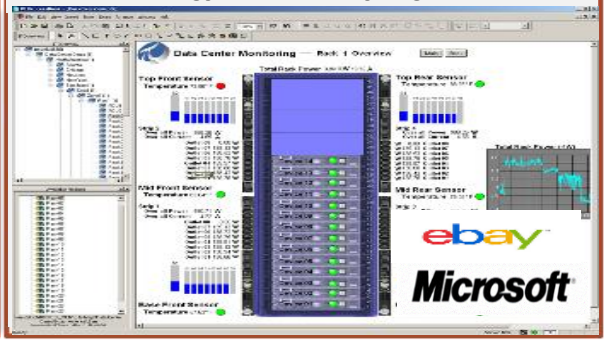
Gas Value Chain Integration & RT Situational Awareness



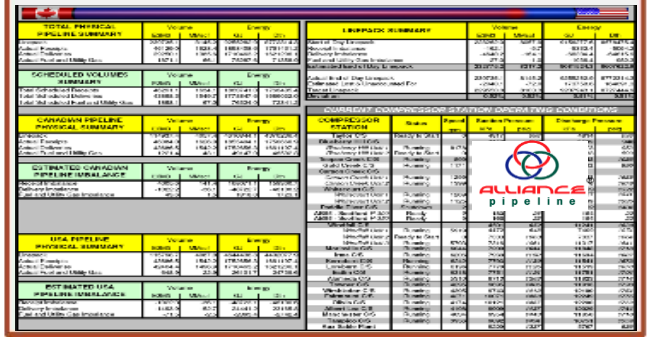
SCADA/DCS Augmentation



IT/SCADA Infrastructure Energy & Reliability Mgmnt



Compliance Reporting, Environmental & Energy Mgmt.



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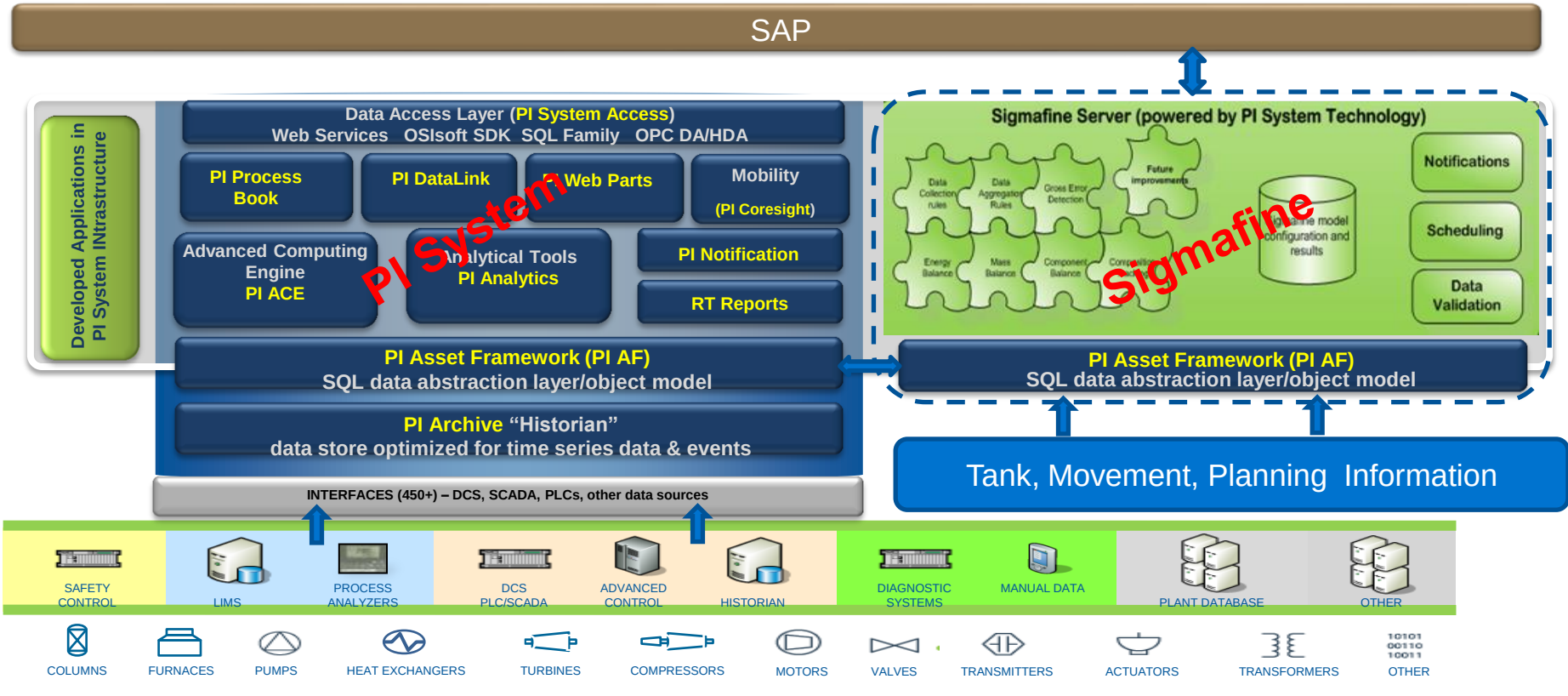
PI System and Sigmafine Integration



Using Sigmafine Data In PI

- Analytics
  - Trends in Reconciled Results
- Notifications
  - Send Notifications based on Analytics Triggers
- Coresight
  - Mobile Visualization of Reconciled Results

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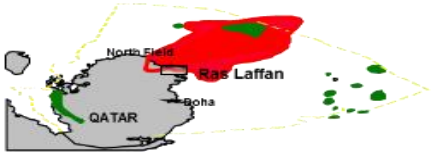
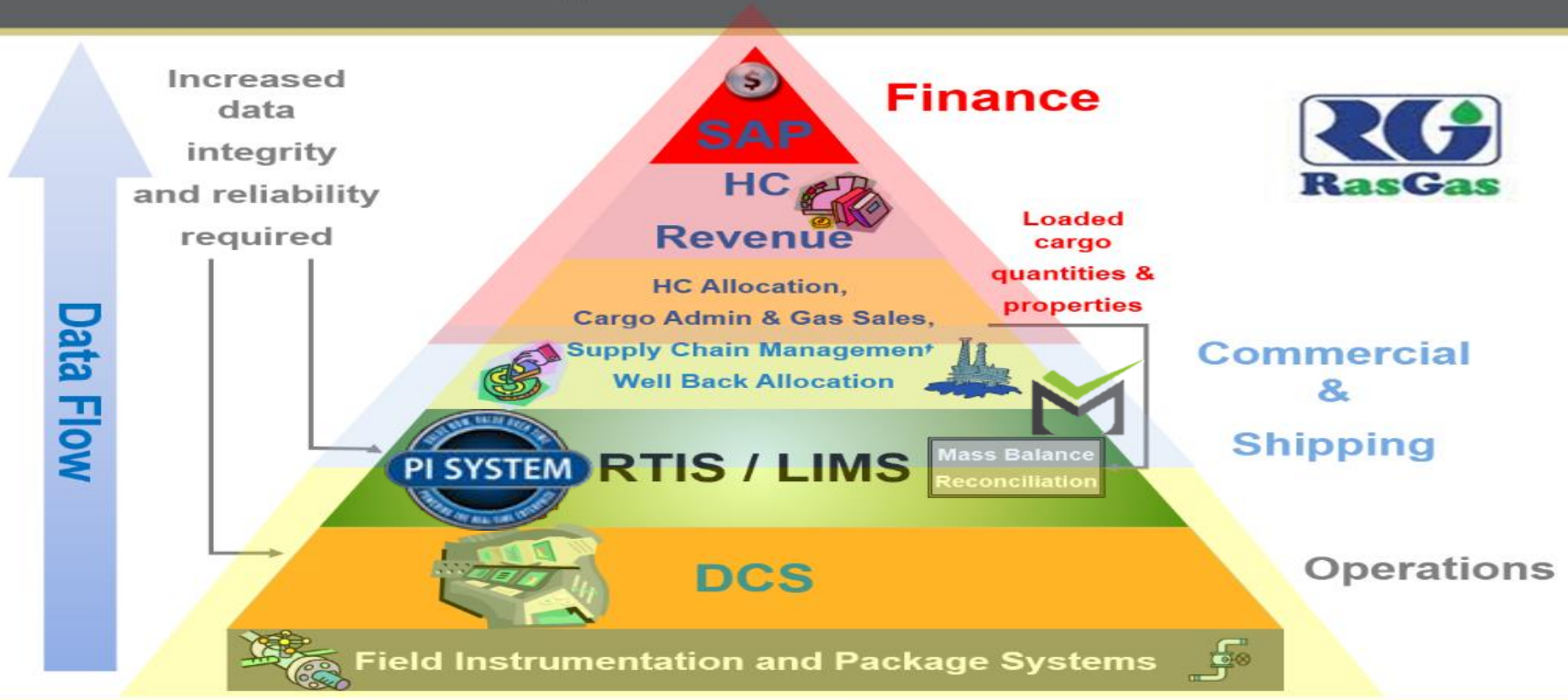
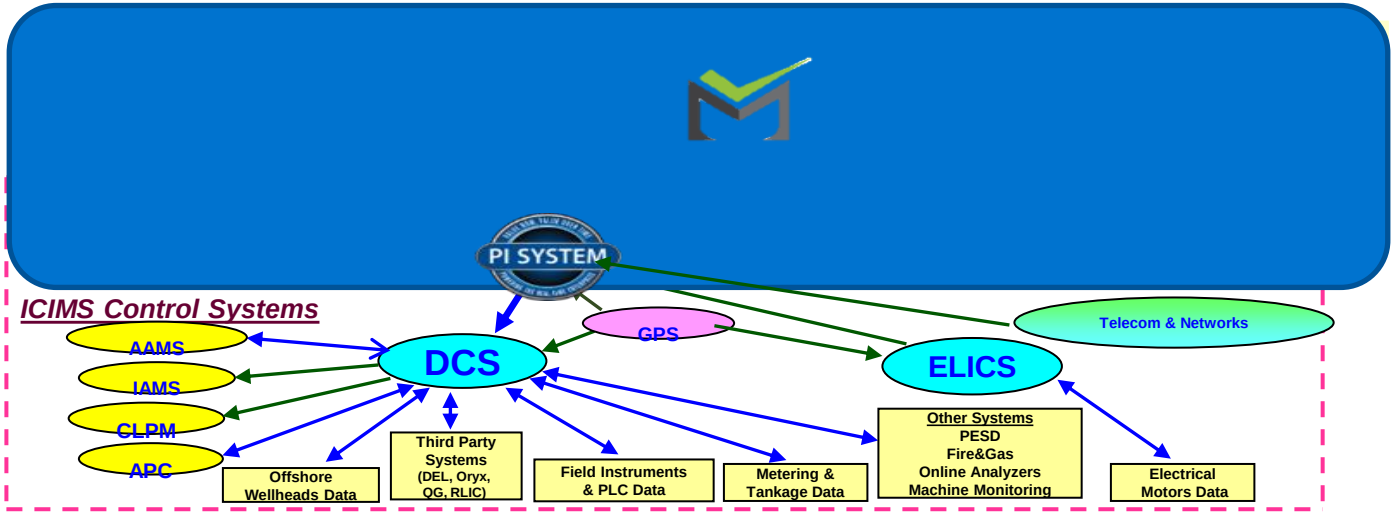


Case Study – Ras Gas

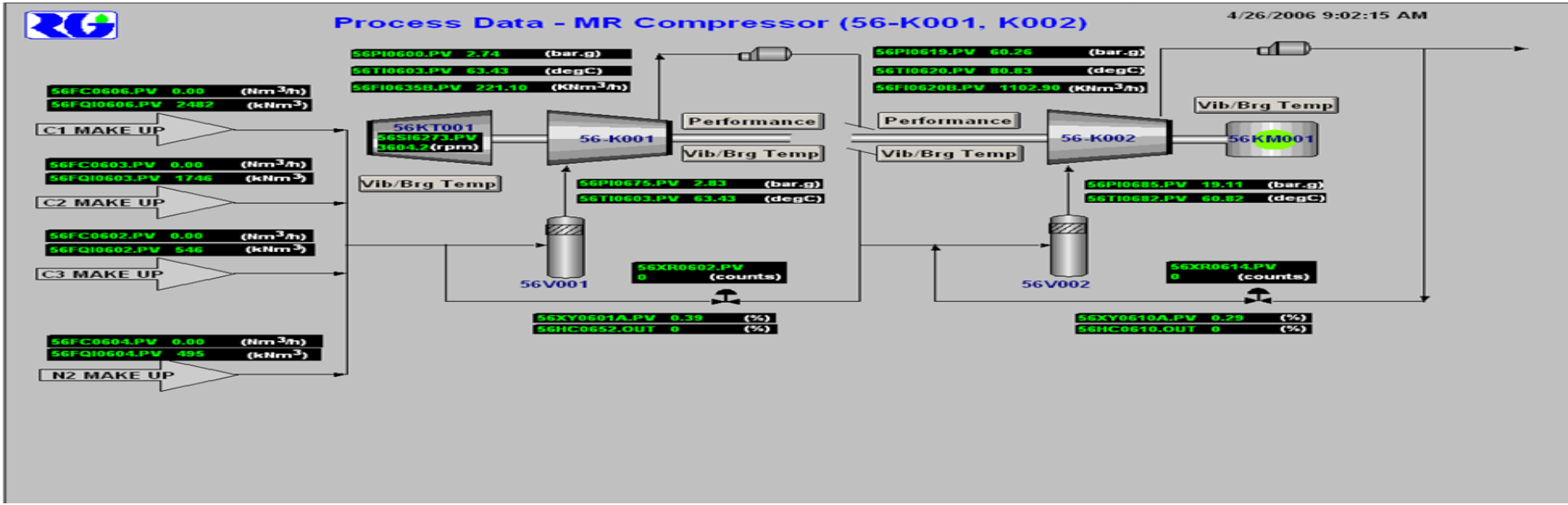
ICIMS Hierarchy and Data Flow



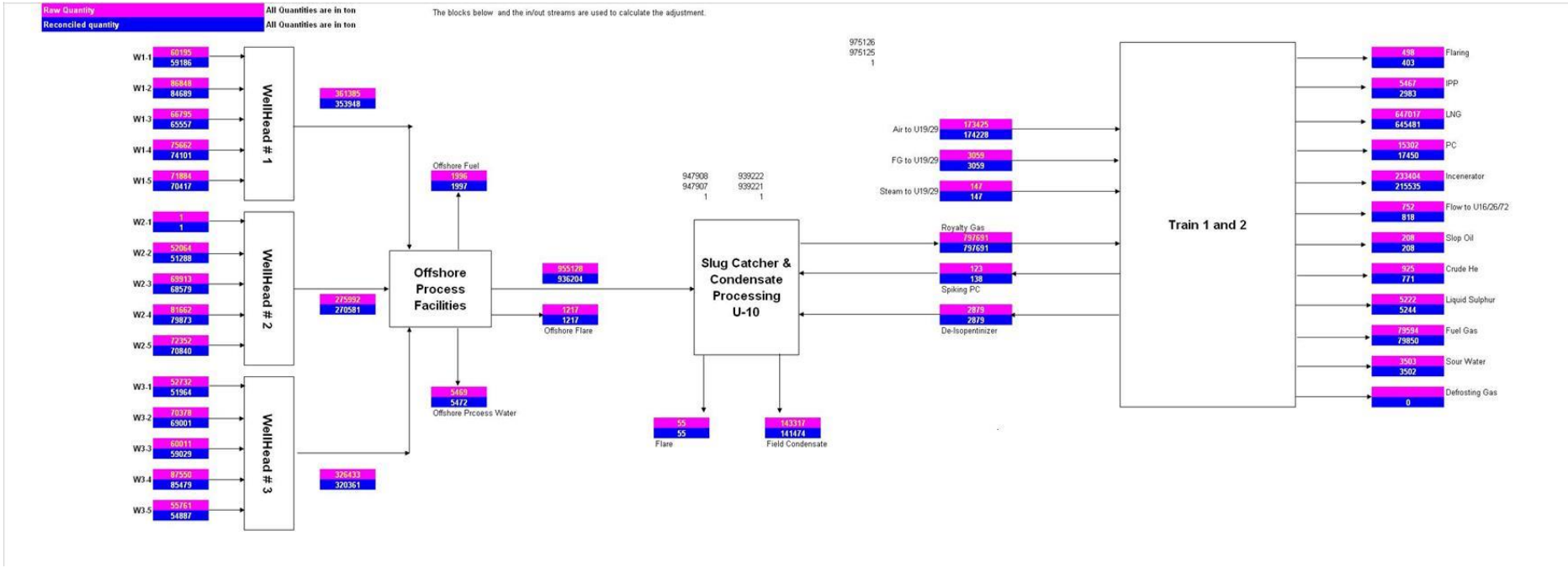
Example of RasGas Using the PI System as an Integration and Applications Infrastructure



Compressor Monitoring



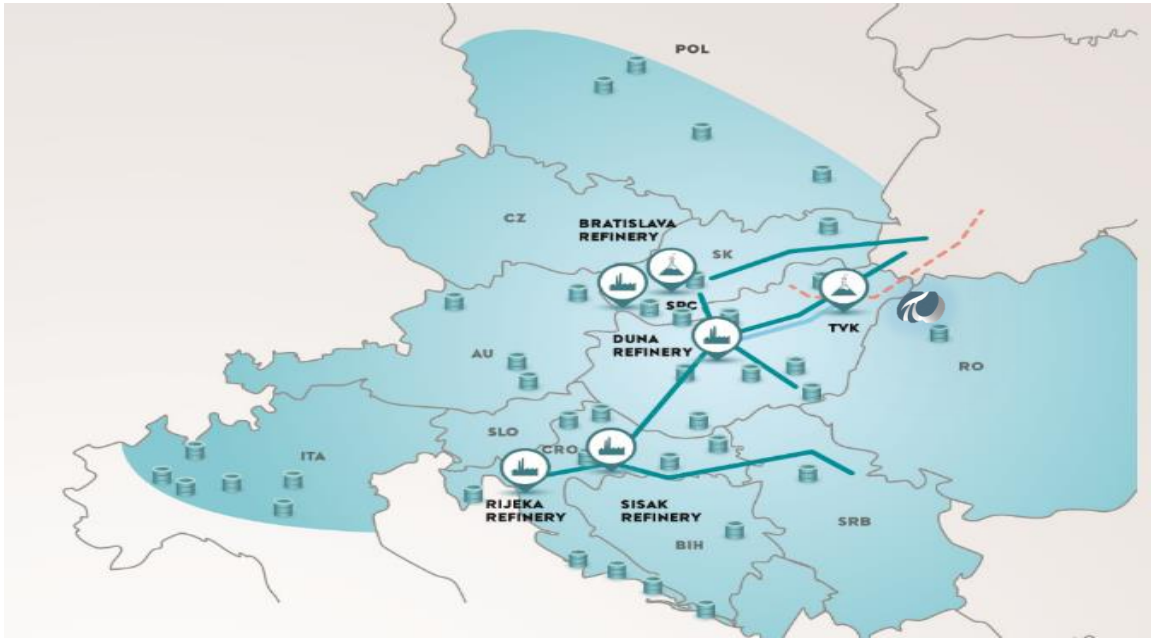
Data Quality and Validation including missing meter data



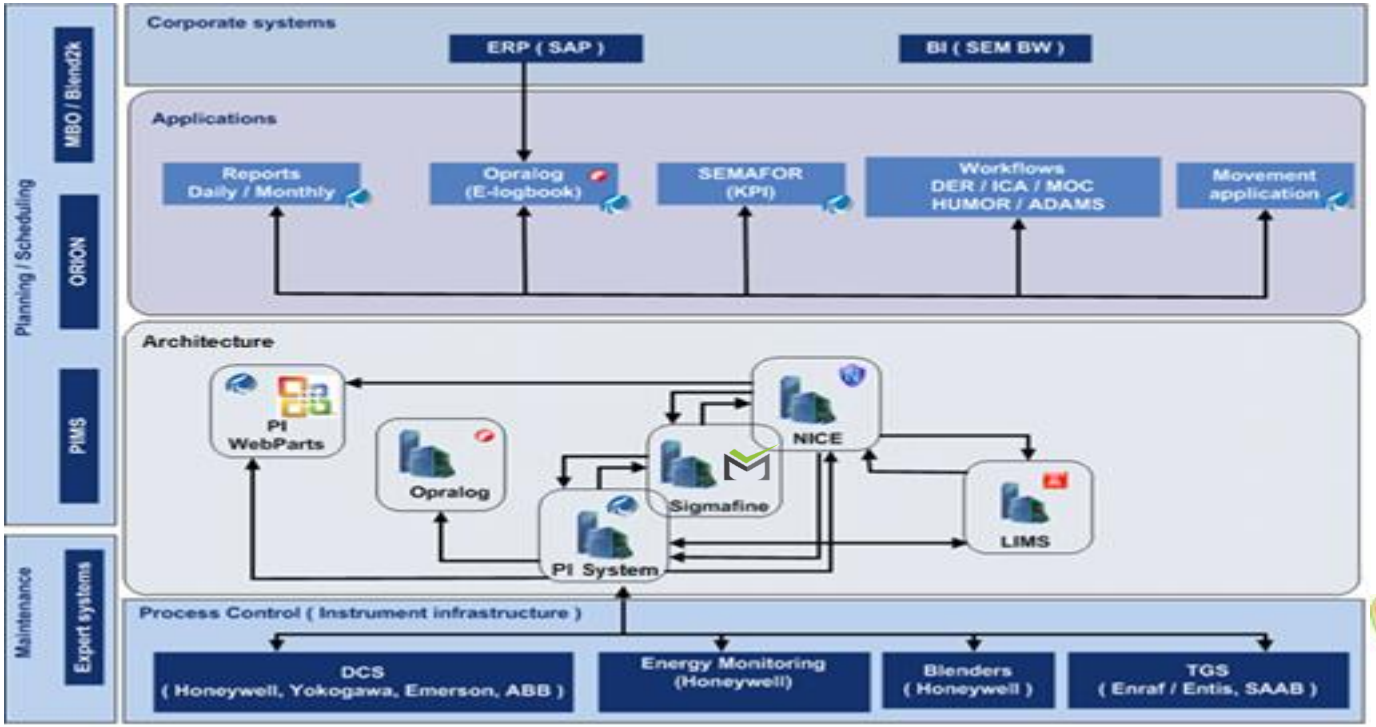
Case Study – MOL Group

MOL Group Downstream

- 6 production units
- 23.5 mtpa refining capacity
- 2.1 mtpa petrochemicals capacity
- >1,900 filling stations
- under 8 brands in 11 CEE
- **370 000 PI Tag capacity**



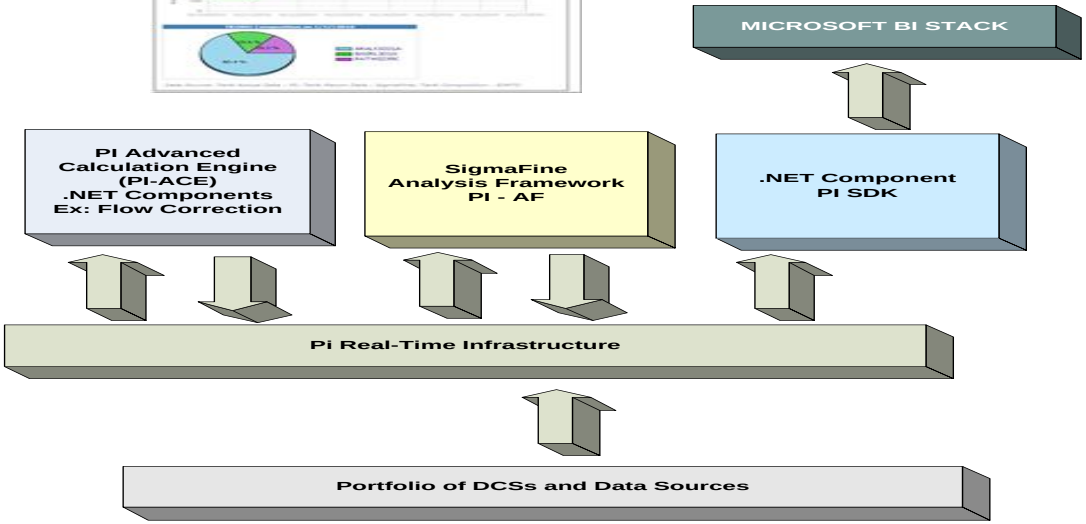
Enterprise Framework



Case Study – Chevron El Segundo

Chevron – Global Consistency

Installing the Infrastructure for Value Over Time

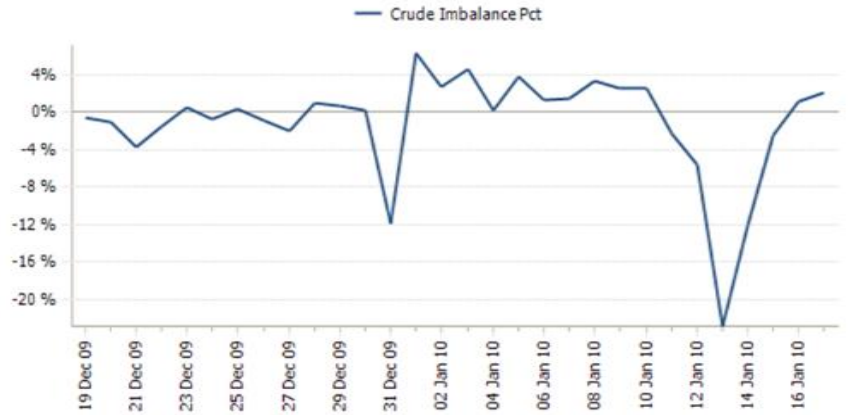


The Refinery Material Flow
Better Product & Raw Material Management

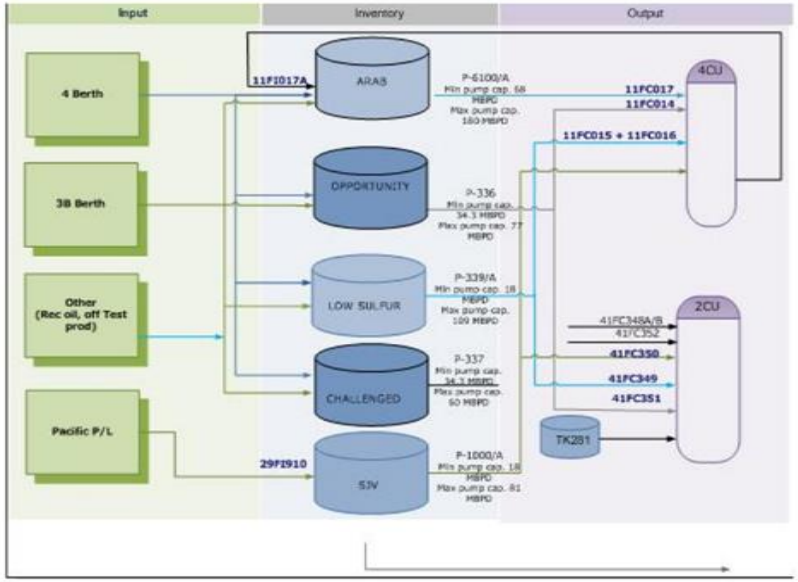
Input		Inventory		Output	=	Imbalance	Imbalance Pct
378.9	-	144.6	-	229.6	=	4.7	2.1 %

Note : All Volume and Meter data in Crude System Dashboard are in MBPD

Crude Imbalance Trend



Crude System Diagram



Integration of PI System & Sigmafine

Refinery Scorecard

Time: **01 Dec 2009***

Mass Balance Scorecard

Process Flow Diagram

	Actual	Target
Overall Imbalance	2.4 %	
Reconciled Mass Correction	1.8 %	

Mass Imbalance and Bad Meters Summar...

Filter Mode

	Mass ImBalance Pct		Bad Meters
	Actual	Status	Actual
2CU	-0.1		2.0
4CU	-1.0		2.0
ALKY	1.9		
ATP	0.0		
CCR	0.0		
COKER	1.5		
DFH	-4.8		1.0
FCC	-0.5		1.0
ISOMAX	0.0		
JHP	0.0		1.0
NHT1	0.5		1.0
NHT2	-3.7		
NHT3	5.3		
PENEX	-4.1		
VGO	-1.0		
VRDS	2.4		

Feed and Yield Summary

Filter Mode

	Feed				Yield			
	Actual	*Reconciled*	Plan	Variance #	Actual	*Reconciled*	Plan	Variance #
2CU	83.9	*35.5*	0.0	0.0	17.5	*32.2*	0.0	0.0
4CU	162.0	*159.6*	210.0	-22.9 %	174.2	*176.2*	212.5	-18.0 %
ALKY	33.5	*34.6*	35.9	-6.7 %	7.0	*7.4*	25.7	-72.8 %
ATP	0.0	*0.0*	0.0	0.0	0.9	*0.0*	0.0	0.0
CCR	0.1	*0.0*	0.0	0.0	0.5	*0.0*	0.0	0.0
COKER	50.0	*49.6*	55.8	-10.4 %	34.4	*36.1*	41.9	-17.9 %
DFH	13.9	*14.6*	14.0	-0.7 %	13.1	*14.7*	14.0	-6.4 %
FCC	59.3	*59.2*	56.0	5.9 %	65.4	*66.4*	68.0	-3.8 %
ISOMAX	34.1	*0.0*	31.8	7.2 %	2.2	*0.0*	37.7	-94.2 %
JHP	0.0	*0.0*	0.0	0.0	1.8	*0.0*	0.0	0.0
NHT1	40.7	*40.9*	30.0	35.7 %	41.3	*41.3*	30.1	37.2 %
NHT2	10.6	*11.7*	8.8	20.5 %	8.6	*10.2*	2.2	290.9 %
NHT3	15.5	*16.9*	14.5	6.9 %	15.6	*16.4*	14.5	7.6 %
PENEX	10.9	*11.4*	17.0	-35.9 %	10.9	*11.1*	16.8	-35.1 %
VGO	38.4	*39.0*	40.0	-4.0 %	39.7	*39.9*	39.5	0.5 %
VRDS	56.5	*53.2*	57.0	-0.9 %	58.5	*56.6*	56.7	3.2 %

**Mass Balance date*

Feed and Yield Values are in MBPD

 # Variance calculated as Actual Vs Plan

Comments by Mass Balance Engineer

No comment exist for this date

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Thank you!

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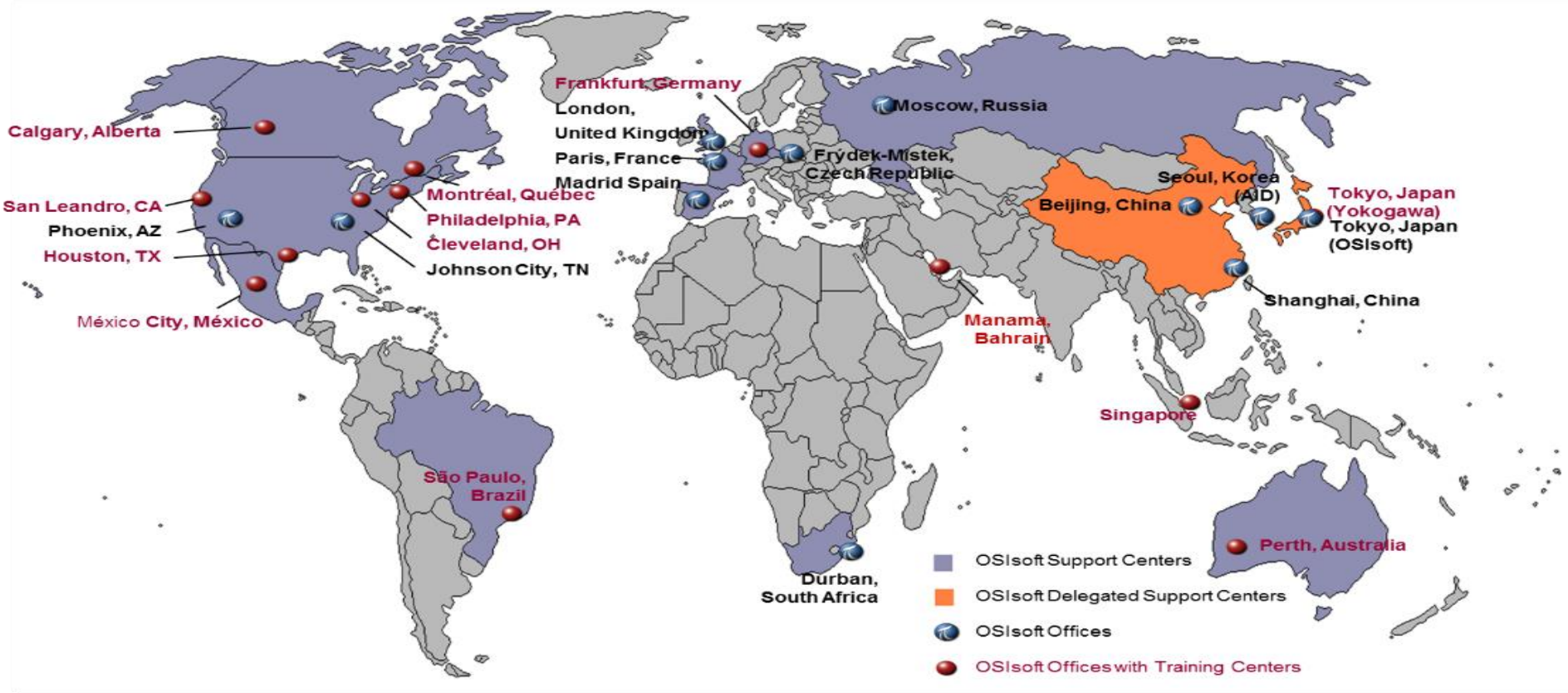
OSIsoft Overview

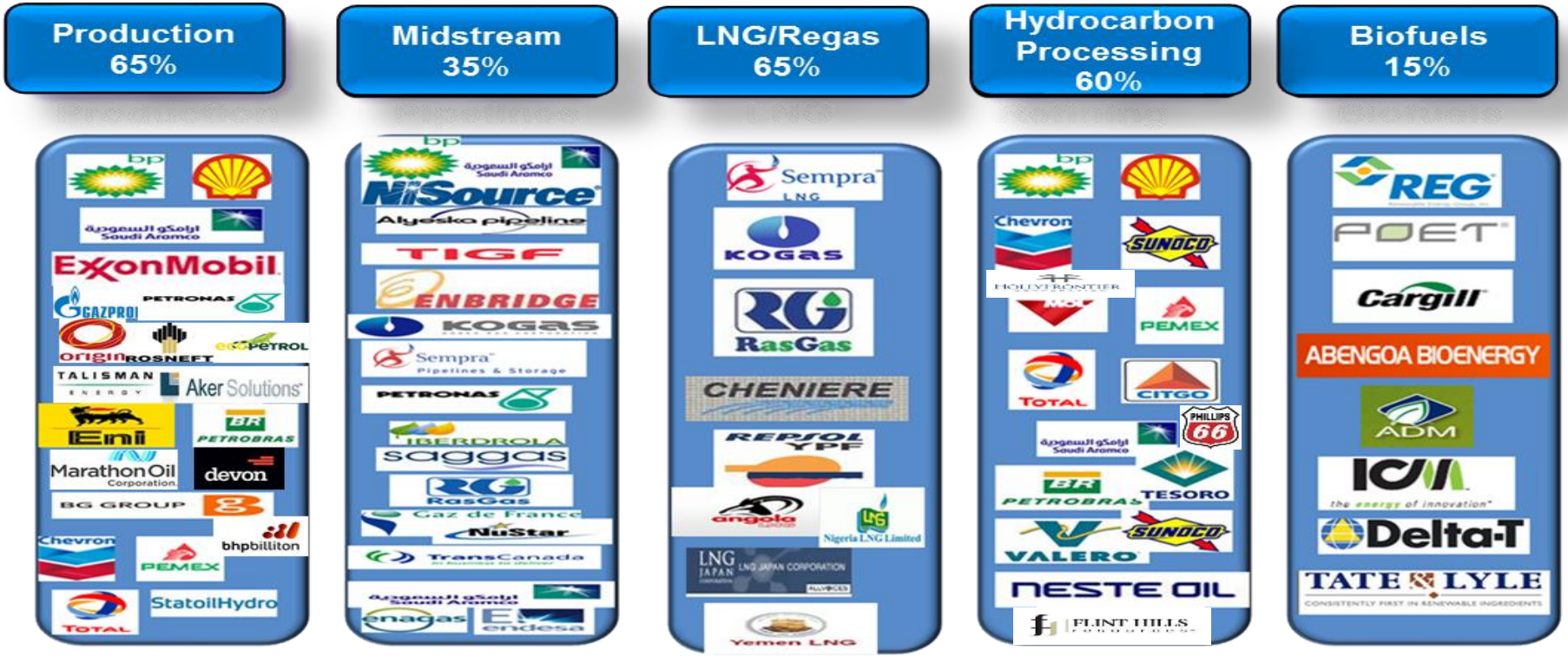
PIMSOFT INNOVATIVE SOLUTIONS

OSIsoft Worldwide Offices



The Standard in O&G - Statement of Value

% Global Capacity Using The PI System



Enterprise Consistency, Alignment, Simplification & Data Transformation

PI System Based Applications & Integration of "Best of Breed Models & Solutions"

Visual Analytics

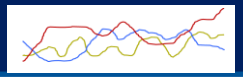
Statistical Analytics

PI System Based Analytics, Visualization & Integration of "Best of Breed" Alternatives

PI System Used as a Data Store

PI System Used as a Data Store

Streaming Data and Events



PI SYSTEM

Asset Structure (Context)

Across the LNG Value Chain & Extended Value Chain

Across the Infrastructure

Exploration | Production | Liquefaction | LNG Transport | Regas | Gas Transmission & Distribution | Trading | Extended Supply Chain | Headquarters & Critical Facilities | Data Centers & IT Infrastructure | R&D

1000's of real-time data and events

DCS

SCADA

Other Control

Other Data