



OSIsoft.

REGIONAL SEMINAR

2012

A P A C

The Power of Data

MALAYSIA



DELIVERING EXTRAORDINARY VALUE IN REFINERY OPERATION VIA PLANT INFORMATION SYSTEM

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 CSE-EIS (SINGAPORE & MALAYSIA)

Presentation Outline

Overview :

- About PETRONAS
- PETRONAS Penapisan Melaka
- PI System in PETRONAS Penapisan Melaka

PI System Operation :

- System architecture
- Data Integration in PI System

Creating Extraordinary Value :

- Monitoring
- Optimization & Improvement
- Reporting

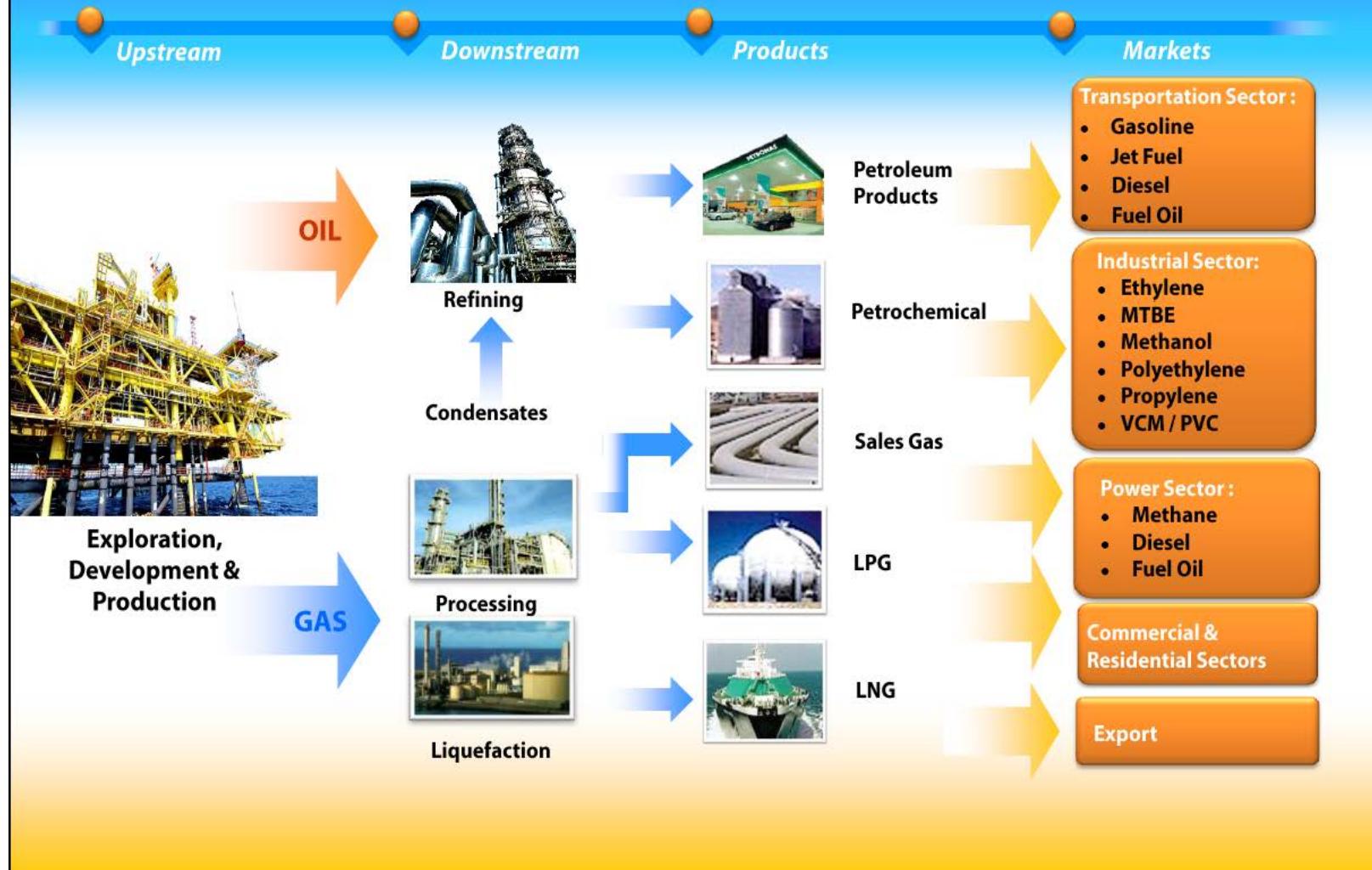


OVERVIEW

About PETRONAS

1. PETRONAS The Corporation

PETRONAS has evolved into a fully integrated multinational oil and gas company



Refinery Business in Malaysia

2. Operations in Malaysia

Refineries in Malaysia

Total refining capacity in Malaysia : 565,300 bpd
PETRONAS refining capacity : 323,300 bpd

Kerteh

- PETRONAS Refinery
- Condensate Splitter

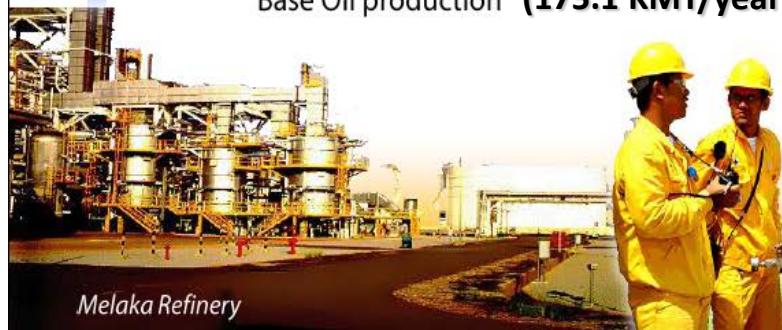
Port Dickson

- ExxonMobil ESSO Refinery
SHELL Refinery

Melaka

- PSR 1 Unit (104,000 bpd)
- PSR 2 Unit (180,000 bpd)

Base Oil production (175.1 KMT/year)





PETRONAS Penapisan
(Melaka) Sdn Bhd
PETRONAS Second
Refinery Train 1 (PSR-1)



Malaysian Refining
Company Sdn Bhd
PETRONAS Second
Refinery Train 2 (PSR-2)



P S Pipeline Sdn Bhd



Petronas Lubricant
International Sdn Bhd



Petronas Dagangan Berhad



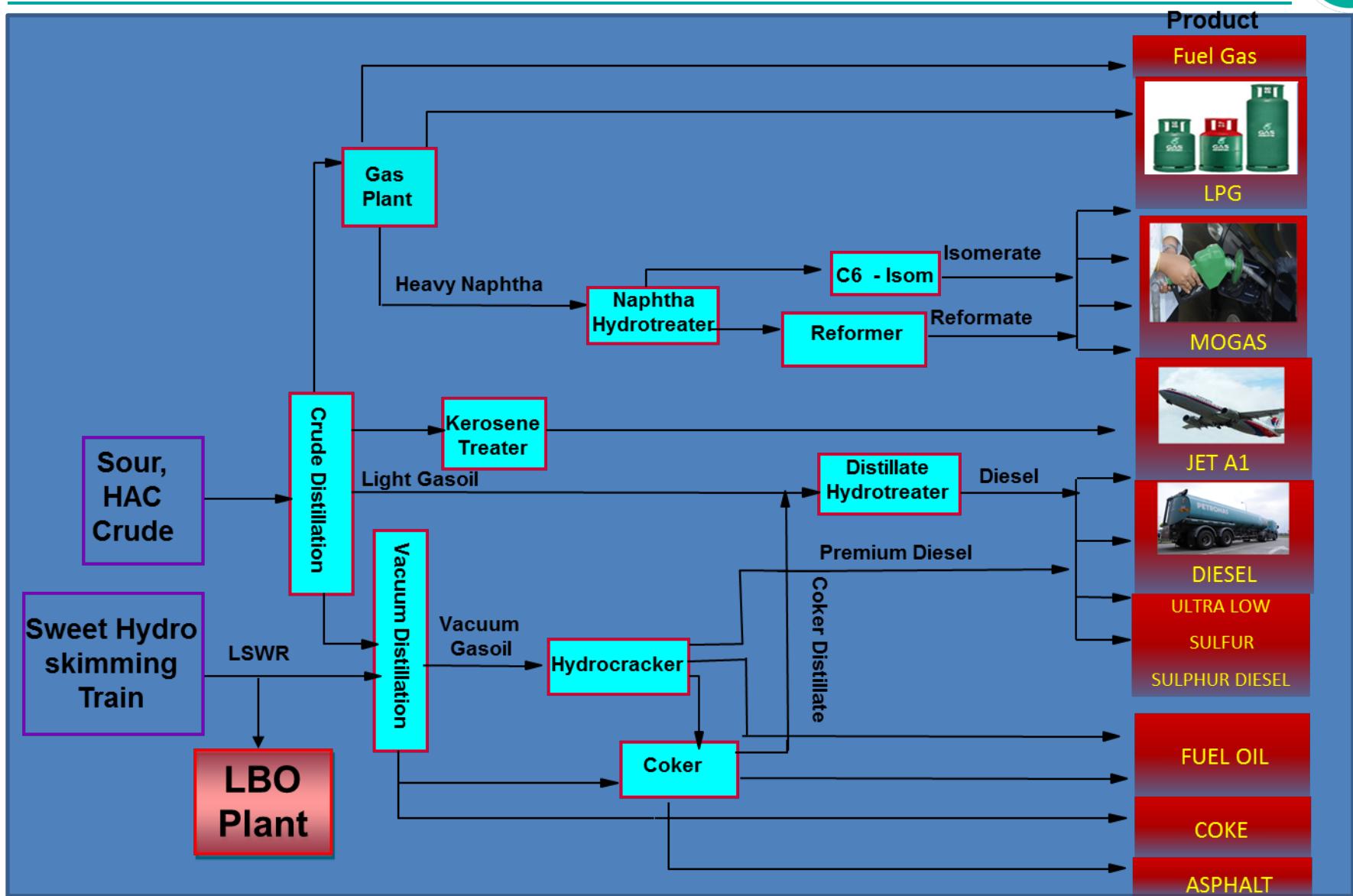
Sungai Udang Port
Sdn. Bhd.



Refinery Site Overview



Simplified Refinery Process Overview



Overview of PI System

Primary process historical database for the refinery complex

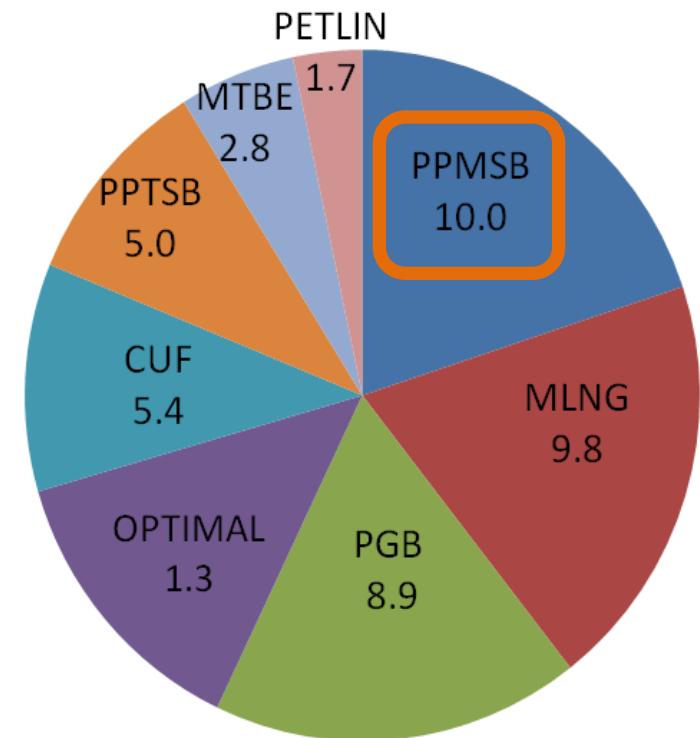
Advanced Process Control (APC) team is the custodian of PI system

Running in High Availability environment

Licensed for 150,000 tags and 70 con-current users

Most complex among PETRONAS OPUs

Complexity of PI system among PETRONAS OPUs



PI System Journey in PP(M)SB

1995 ~ 2000 2001 ~ 2002 2005 2006 2007 2008 2009 2010 2011

PSR1 : Using Mentus for graphics and Info Plus for reporting/calculation

PSR1 : Upgraded Info Plus to Info Plus X

PSR2 : Started to implement Plant Information (PI) system during commissioning

PSR1 : Introduced PI system

PSR1 & PSR2 : Upgraded DCS data collector from AXM to App Node

Installed new PI HA and PI Real Time Web

MG3,HPU2,COGEN : New data & graphics

PI ACE & database upgrade and PSR2 Revamp

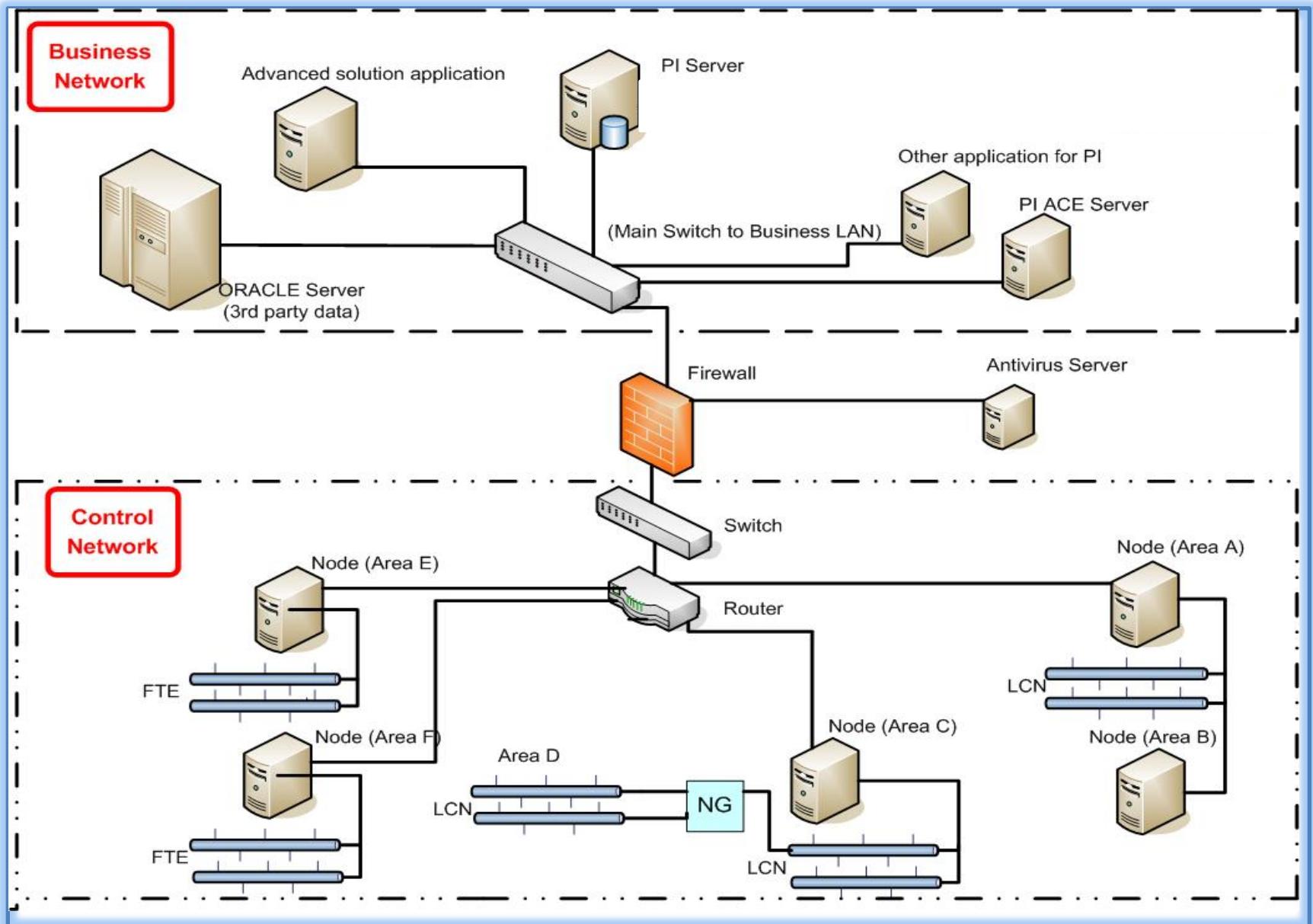
PSR1 & PSR2 : Upgrade DCS data collector @ new App Node with PHD

2012



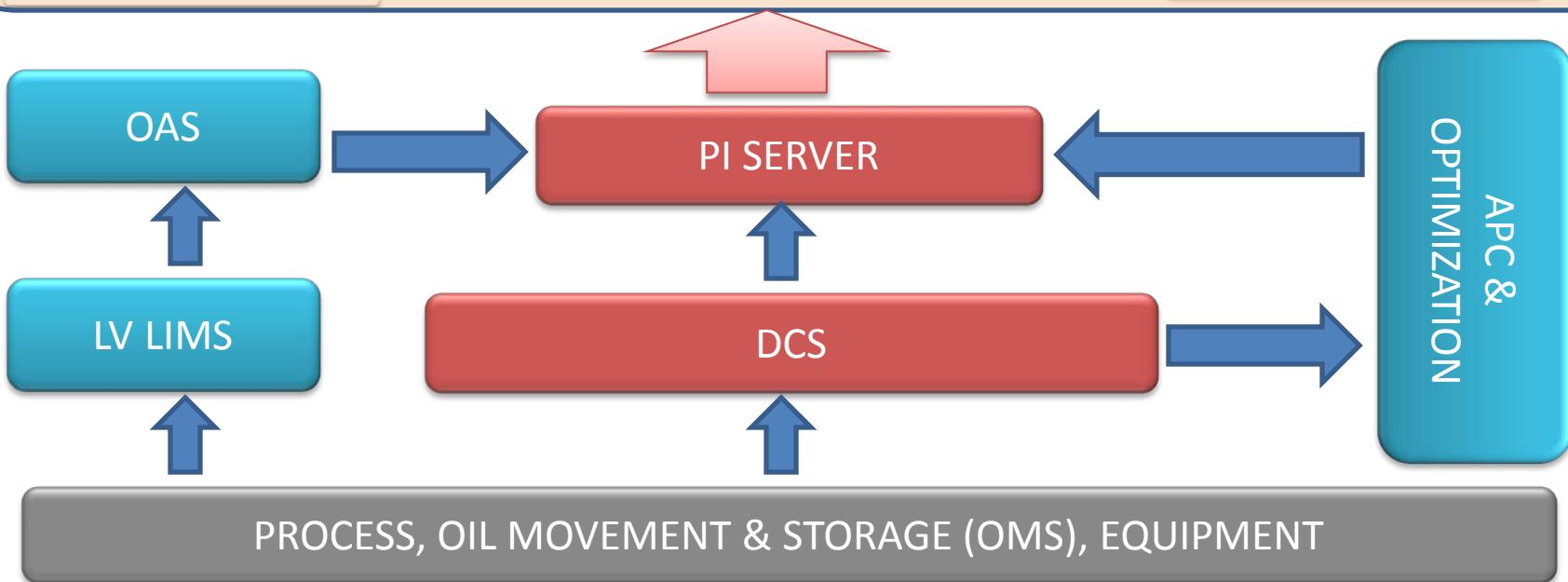
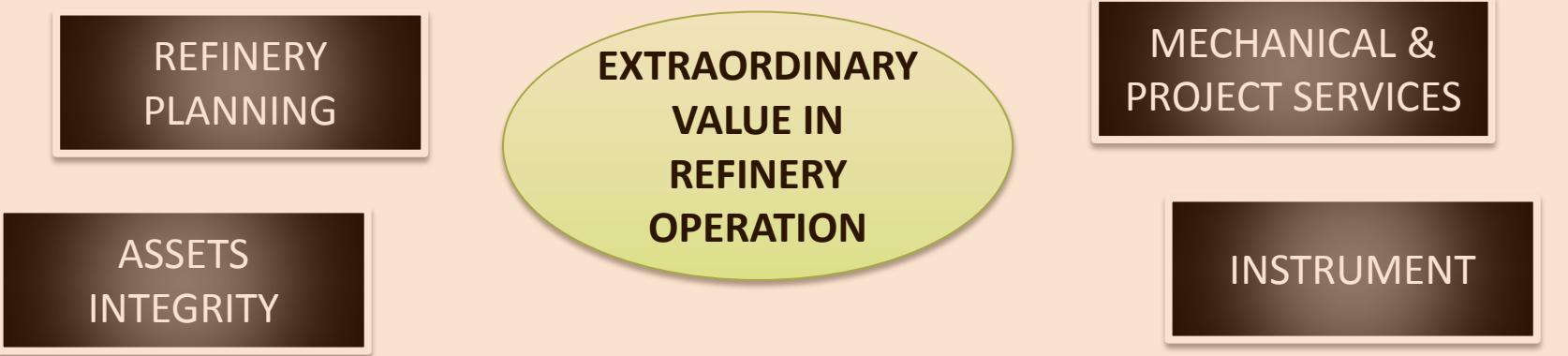
PI SYSTEM OPERATION

System Architecture



Data Integration

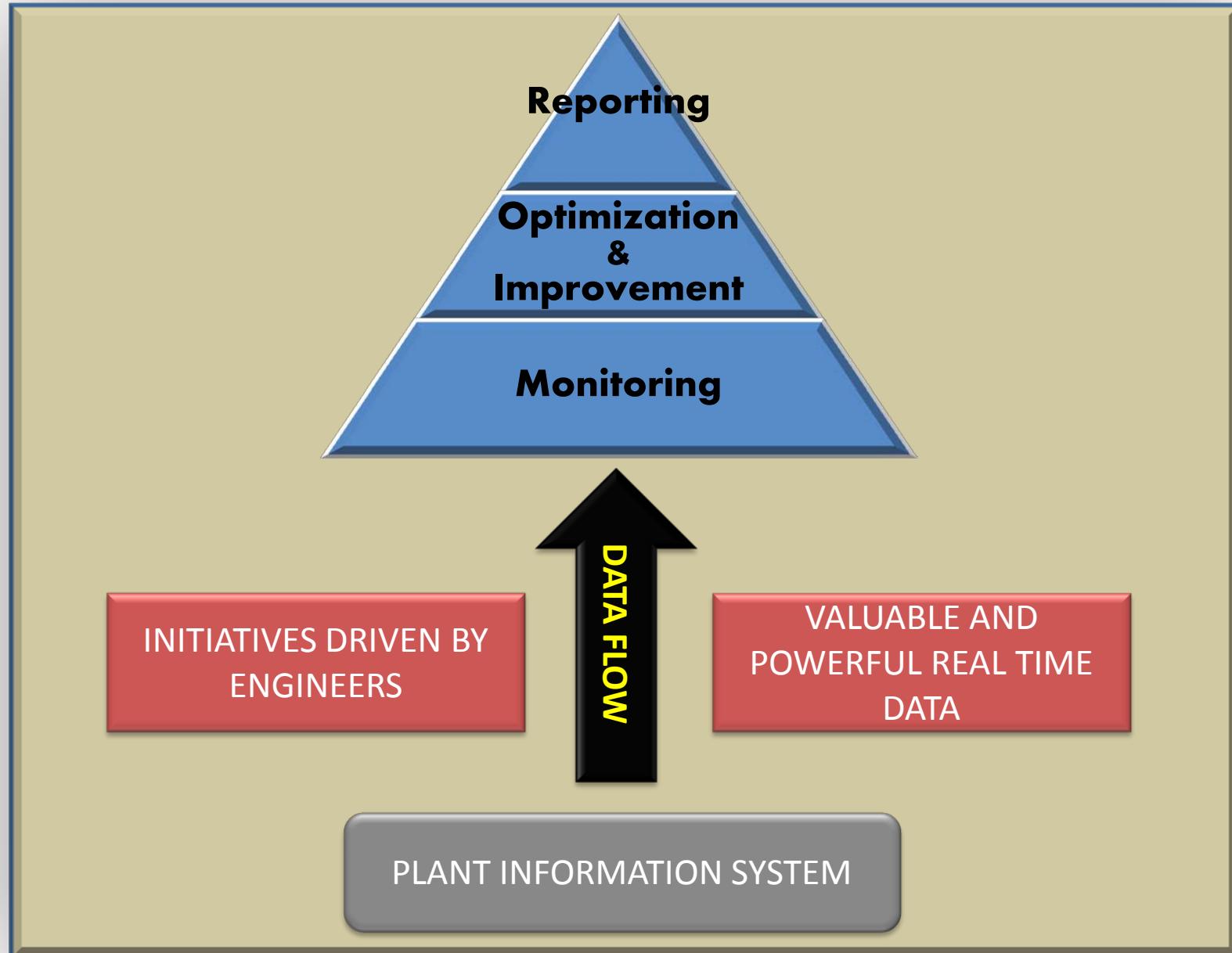
Integrated in an informative environment by PI System

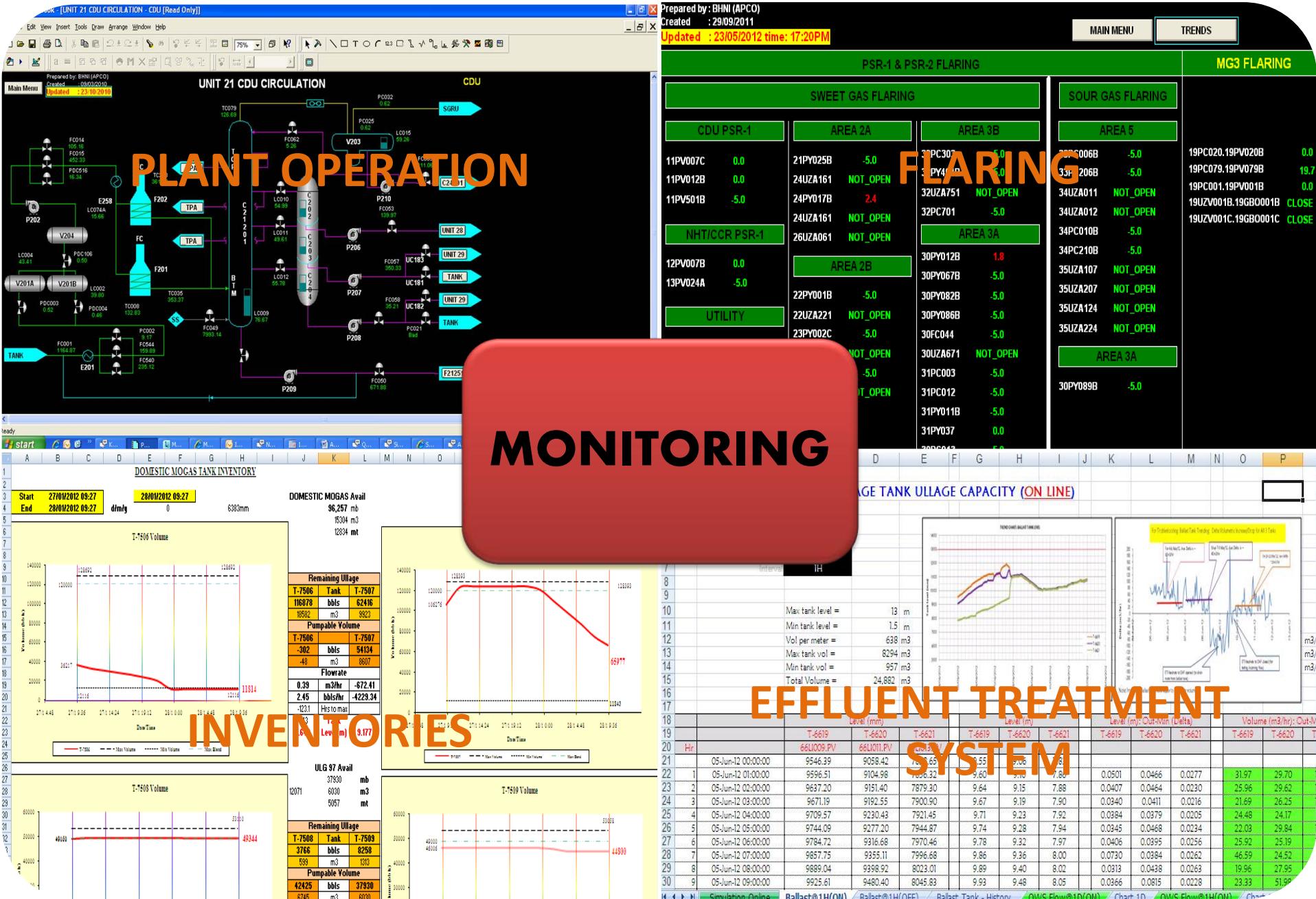


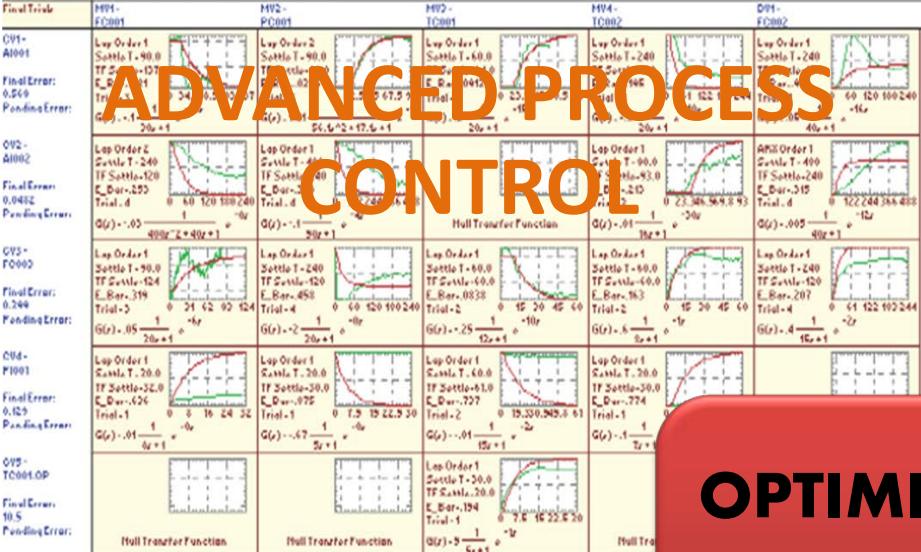


CREATING EXTRAORDINARY VALUE

Creating Extraordinary Value







ENERGY MANAGEMENT SYSTEM

Main Menu

Fuel Gas Mass Balance

Steam Mass Balance

ENERGY MANAGEMENT SYSTEM

Utilities Optimizer

Steam System Optimization (Steam & Electricity Producers and Letdowns)

Steam System Optimization - Running Equipment Status

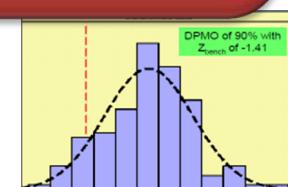
Utilities Cost Summary - RM

Utilities Priority Table

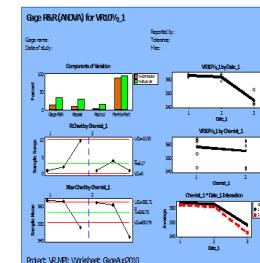
BLENDING OPTIMIZATION



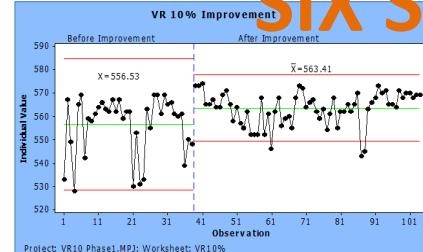
OPTIMIZATION & IMPROVEMENT



Measure



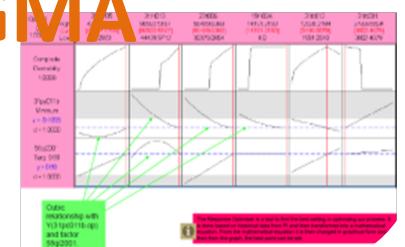
Control



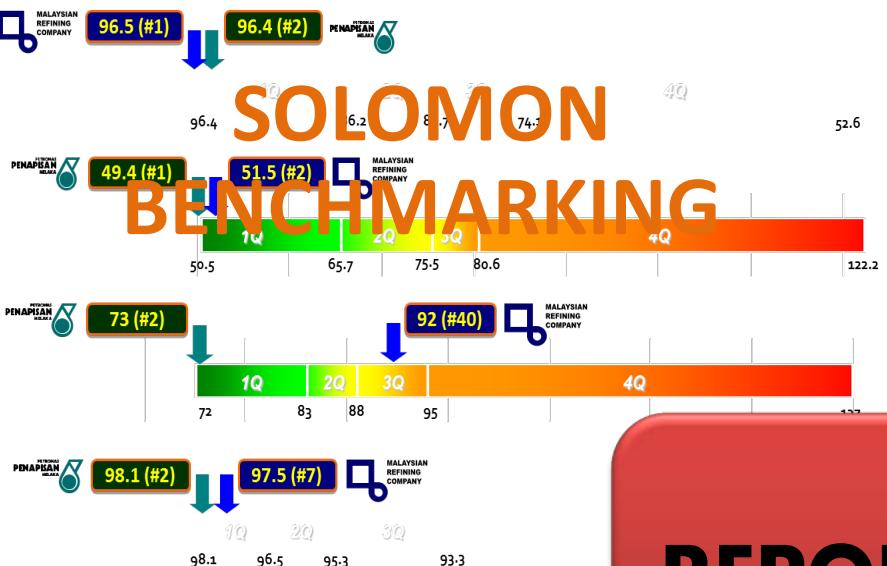
Analyze

Regression Analysis: VR 10% versus HVGO Draw Temp, FishZoneTemp
The regression equation is:
21scd2134-sim_10 = 309 - 0.779 HVGO Draw Temp + 0.790 FishZoneTemp
Predictor Coef SE Coef T P VIF
Constant 309.44 67.70 7.53 0.000
HVGO Draw Temp -0.7795 0.2318 -3.36 0.000 1.302
FishZoneTemp 0.7896 0.1600 4.94 0.000 1.302
S = 8.03013 R-Sq = 52.7% R-Sq(adj) = 48.6%

Improve



Ranking in Asia Pacific - 2008 (61 refineries)



REFINERY SHIFT MANAGER HANDOVER REPORT

RSM On Duty:	Sator Boyudi	Date/Time:	30-Jun-12 08:25	Shift:	1930° 0730 hrs									
Marshall	Abd Rahim Jamil	Trainee RSM:		Shift Group:	D									
			REFINERY SHIFT MANAGER REPORT											
HEALTH, SAFETY, ENVIRONMENT AND SECURITY			SHIFT OPTIMIZATION - REFINERY TOP 3 CONCERN											
Nil.			DRIVER											
*PI System temporarily interrupted due to communication. All data is PSU 1400.														
UNIT 11-CDU1 & CFU (MDR 104,000 BPSD & MDR CFU 27,000 BPSD)			CFU FEEDING INFORMATION											
CDU1:			Tank	MBD/Oag	Crude	Hours	Tank	MBD/Oag	Condensate	Hours				
V101(%):	60.3	Passed(%):	96.5	BPSD	96%	Throughput	T-7101	0.0	Tapis	64.6	T-7105	0.0	BNC	24.3
F1101:	Exs.Ox2	1.5	CT(C):	198	COT(C):	339	Flaring	0.0	X					
Desalter Pressure:	18.6	Ikg/cm ²	CFU1 Load m ³ /hr:	771	Old Temp:	135	C							
Cruding OP:	-5.0	m ³ /hr	CDU1 New Train:	18,963	BPSD									
CFU-Cruding	19,924	BPSD	C-1151 Inlet T(C):	119										
F1151:	Exs.Ox2	5.8	CT(C):	211	COT(C):	229	Flaring	-5.0	%					
CFU FEEDING PUMPS			P-1101A	P-1101B	P-1105A	P-1105B	P-1102A	P-1102B	P-1151A	P-1151B	CFU PUMPS			
Tank Drop:	0.0	Flow(m ³ /hr)	38.8	Flow(m ³ /hr)	42.3	Flow(m ³ /hr)	18.0	Flow(m ³ /hr)	18.0	Flow(m ³ /hr)				
Quality			Product	m ³ /hr	Quality									
81	Dens.:	0.611	Light Kerosene	20	Flash	38.5	Freeze	-55.2	GC-5	145.0	GC-FBP:	195.4		
43.7	Dens.:	0.685	Light Kero to Tankage	14										
148.7	C ₁ :	0.0	SR Kerosene	130	Flash	48.5	Freeze	-52.0	GC-FBP:	256.4				
106.0	GC-FBP:	172.9	SR Diesel 1	218	Flash	75.0	Pour	12.0	SIM-95:	399.5	Color:	25		
			SR Diesel 2	32	Flash	70.0			Density	0.834	Viscosity	3.451		

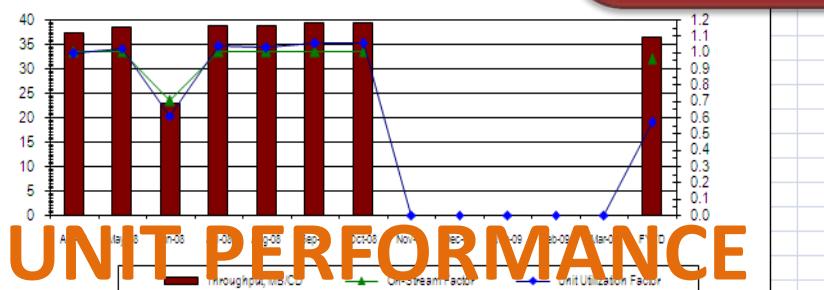
Energy breakdown by Unit



UNIT PERFORMANCE ENERGY PERFORMANCE

UNIT PERFORMANCE

Throughput, On-Stream Factor, Cap. Utilization Factor



Notes: Design Throughput = 28.5 kBD/D; MDR = 37.5 kBD/SD

Unit Utilization Factor = Actual kB/CD / MDR

On-stream Factor = Stream Days / Calendar Days

CSE-EIS's Role in Supporting PPMSB PI System-Cont'd



1997 – 1999

- Implementation and Warranty Support Services of PI System

2000 Present

- Maintenance & Support of PI System

Future

- PI System as Strategic Integration & Applications Infrastructure
- Develop more applications using PIWebPart / MS Sharepoints

CSE-EIS's Role in Supporting PPMSB PI System- Cont'd

Refinery Performance Calculations for PPMSB: -

- Hydrocarbon Flow Compensation
- Furnace Duty And Efficiency
- Heat Exchanger Duty, Fouling Factor and Overall Heat Transfer Coefficient
- Pump Efficiency
- Compressor Efficiency
- Cumulative On-stream Factor and Capacity Utilization Factor

CSE-EIS's Role in Supporting PPMSB PI System- Cont'd



- Migrate existing PI Server 3.4.375.99 x 32-bit to PI Server 2012 64-bit on Virtual environment
- Configure:
 - PI Notification 2012
 - PI Coresight
 - Setup Asset Hierarchy in PI-AF
 - Dashboard
- Integration of SAP
- Engineering Services:-
 - Standard equipment displays showing process values and equipment operating points
 - Summary displays rolling up information from detailed displays
 - Calculation of performance values related to equipment

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THANK
YOU