



Regional Seminar Series Chevy Chase, MD



AES Performance Suite

Larry Driskill - Director, Sourcing and Plant Operations
Systems
AES, Arlington, VA

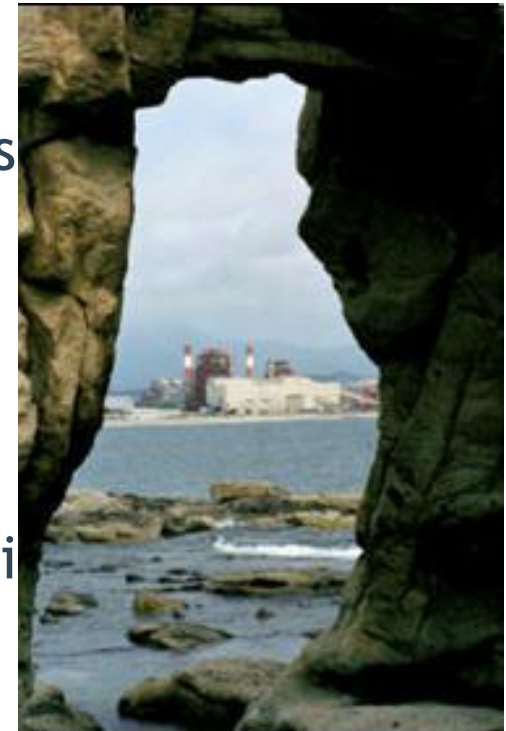
November 11, 2010

- AES Corporation Overview
- Global Applications
- The PI System at AES
- AES Huntington Beach Generating Station
- The Plant Manager Performance Dashboard
- How the Dashboard Solution Impacts the Business

AES Corporation



- A Unique Global Power Company
- Core Business is Electricity Generation, Transmission and Distribution
- 2009 Revenue \$14.1B; Assets \$40B
- 31 Countries of Operation on 5 Continents
- Broad portfolio of fuel and market types
- More than 40,300 Megawatts Installed Capacity
- 14 Utilities
- 100 Million Customers
- Workforce of ~ 27,000 people
- NYSE (symbol AES)



AES Global Applications

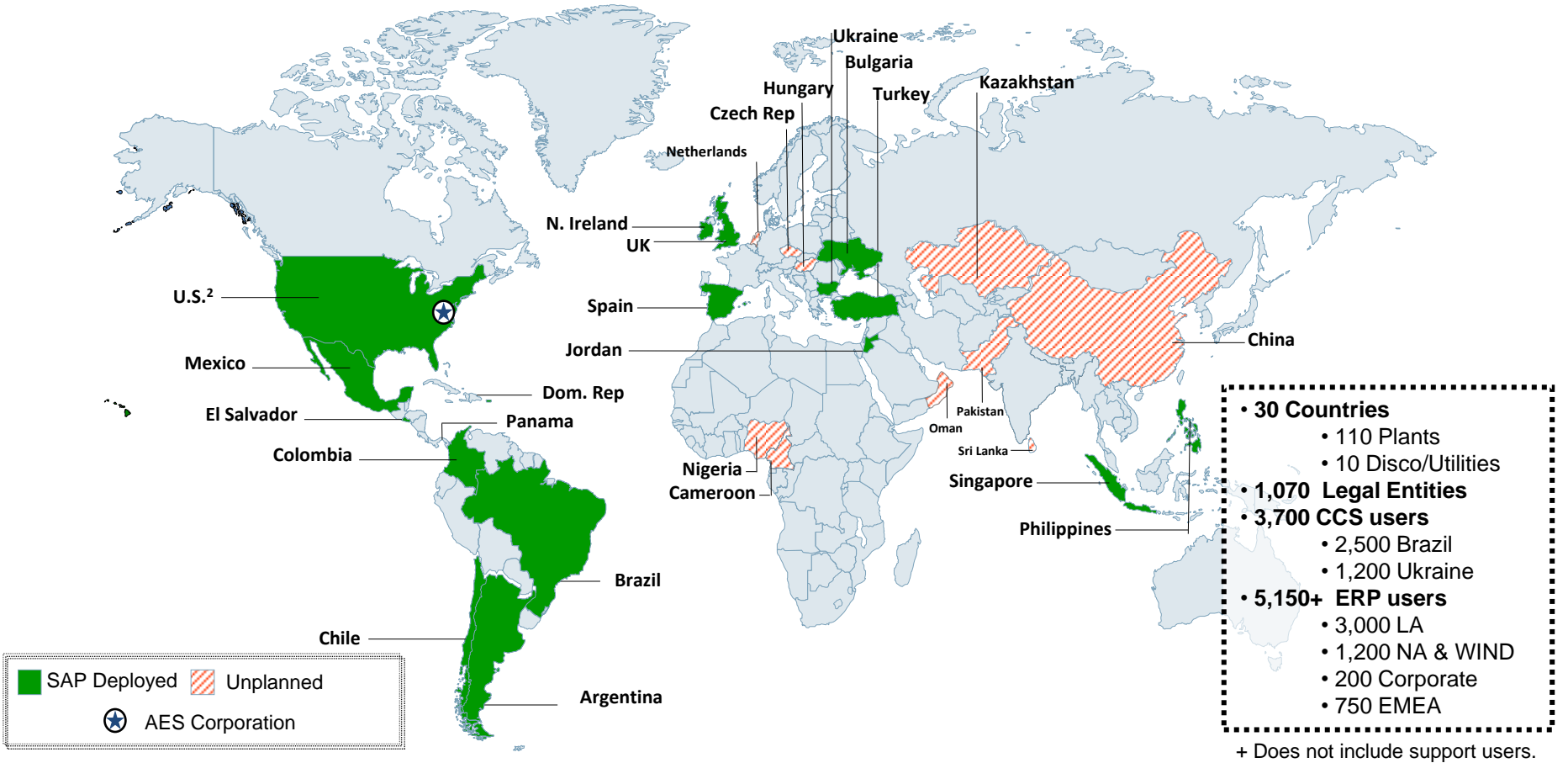


AES Genesis Landscape

Supporting Generation and Distribution Operations in 30 Countries



As of November 2010, Genesis supports 80% of AES Genco and Disco revenues, 69% of EPS¹ with up to 10,000 users



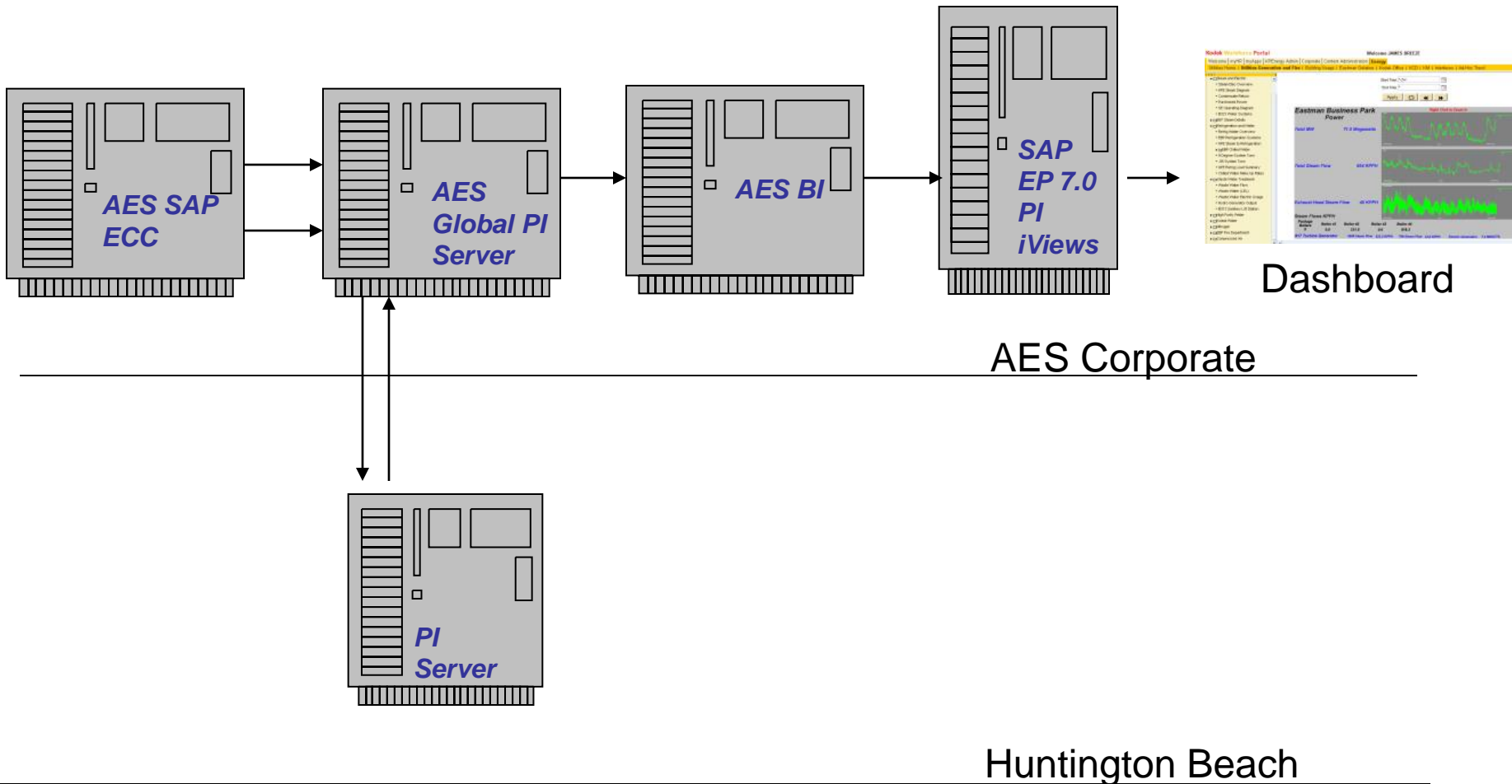
¹ 2010 Countries: Philippines, Ireland and Manila, Richmond & Singapore Hubs. In addition complete NA deployments (3 plants) EMEA and Wind.
² Includes Hawaii & Puerto Rico, excludes IPL.

The PI System at AES



- AES' use of the PI System:
 - Data Historian
 - Non-financial performance analysis
 - Monitoring of key regulatory parameters - permits and other related
 - RLINK connection to SAP ECC for triggering Preventive Maintenance Work Orders
- AES has 31 server installations of the PI System globally with 420,000 tags
- AES' global PI Server supports 2,000 tags
- Huntington Beach PI System
 - 50 tags to the global PI Server updated hourly
 - 24 hour rolling trend of Key Parameters

PI Server Architecture



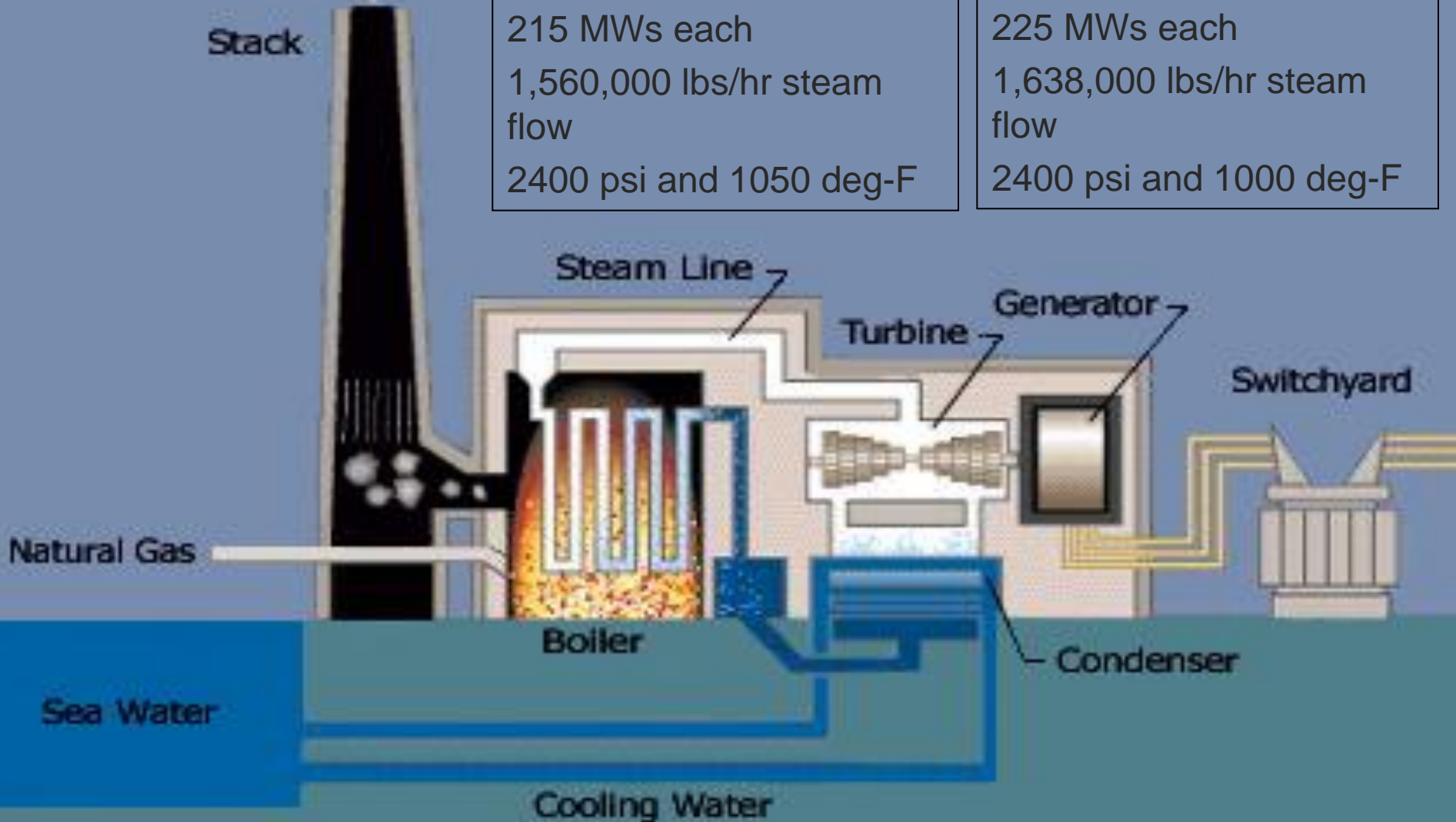
Gas Fired Power Plant

Units 1&2

215 MWs each
1,560,000 lbs/hr steam flow
2400 psi and 1050 deg-F

Units 3&4

225 MWs each
1,638,000 lbs/hr steam flow
2400 psi and 1000 deg-F



Dashboard Display

Click on

- AES
 - North America
 - NA East
 - NA West
 - TEG TEP
 - Shady Point
 - Merida
 - Hawaii
 - Deepwater
 - Southland
 - Alamos
 - Redondo
 - Huntington Beach
 - Unit 1
 - Unit 2
 - Unit 3
 - Boiler
 - Turbine
 - Circ Water
 - Electrical
 - Unit 4
- EMEA
- LA&A

AES HUNTINGTON BEACH UNIT 1 CONDENSER

PERFORMANCE DASHBOARD

	ACTUAL	TARGET	PROFIT & LOSS
COND BACKPRESSURE	30.18 Hga	30.18 Hga	0.30 \$/hr
COND BACKPRESSURE (NO FOULING)	30.18 Hga	Call Alarm	
COND FOULING FACTOR EAST	85.00%	90.00%	
COND FOULING FACTOR WEST	85.00%	90.00%	
CONDENSER TTD	145.40	Call Alarm	
CONDENSER DCA	168.80	27.50	
WATERBOX DP EAST (TIDE COMP)	0.20		
WATERBOX DP WEST (TIDE COMP)	27.40		
CONDENSER HEAT DUTY	0.00		

B-53 Low Pressure Steam

Component	Availability of Back-up	PM Complete?	Open Work Order Priority		
			Critical	Medium	Low
...	Y	N	0	1	0
...	Y	Y	1	1	1
...	Y	N	0	0	3
...	N	Y	0	0	0

iViews update dynamically

Graphic from PI
Trend from PI
W.O. Summary from SAP

PI System iViews in the AES Performance Suite



HB Condenser Display - SAP NetWeaver Portal - Windows Internet Explorer

https://wwwdv.ouraes.com/irj/portal/#

File Edit View Favorites Tools Help

Personalize

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PI System

Detailed Navigation

- HB Condenser Display
- HB Back Pressure
- HB Condenser Clean
- HB Water Box
- SAP Info

RtGraphic

AES HUNTINGTON BEACH UNIT 1 CONDENSER

GROSS GENERATION	0.00 MW
NET GENERATION	0.00 MW
PROFIT/LOSS	0.00 \$/hr

PERFORMANCE DASHBOARD	ACTUAL	TARGET	PROFIT & LOSS
COND BACKPRESSURE	30.1In Hga	30.1In Hga	0.00 \$/hr
COND BACKPRESSURE (NO FOULING)	30.1In Hga	Calc Failed	-800 0 800
COND FOULING FACTOR EAST	85.00%	80.00%	TTD & DCA 148 182 145.5 145 180
COND FOULING FACTOR WEST	85.00%	80.00%	
CONDENSER TTD	145.40	Calc Failed	Waterbox DPs 4.2 3.8 3.2 3.2 3.7
CONDENSER DCA	180.60	27.00	
WATERBOX DP EAST (TIDE COMP)	3.20		Fouling Factors
WATERBOX DP WEST (TIDE COMP)	37.40		
CONDENSER HEAT DUTY	0.00		

WASH ADVISOR (E, W) CIRC WTR FLOW AIR-IN LEAKAGE

SALT LEAK ADVISOR (E, W) CYCLE ISOLATION

High Waterbox DP-West High Conduc

Condenser Efficiency Analysis Tool



Personalize



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PI System

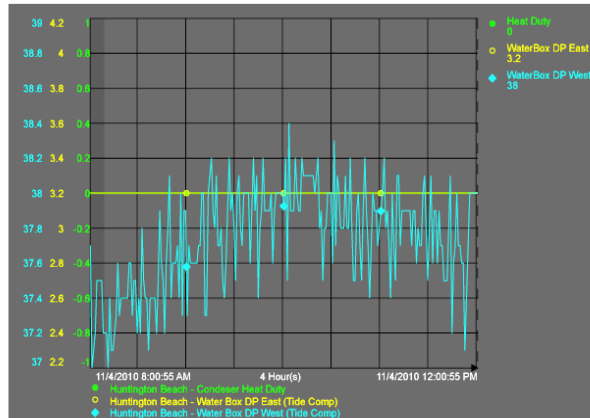
Detailed Navigation

- HB Condenser Display
- HB Back Pressure
- HB Condenser Clean
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- SAP Info

RtGauge



RtTrend



RtTimeRange

Start Time: *4h
End Time: *
Apply [Refresh] [Previous] [Next]
*-12h to * *-1d to * *-1w to *

RtTreeView

Use Alias
Huntington Beach, CA

Help

PI Alerts (fouling factor, DCA, TTD)



Personalize

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PI System

Detailed Navigation

- HB Condenser Display
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RtGauge

Fouling Factor East - Actual = 0.8500

Fouling Factor West - Actual = 0.8500

Fouling Factor - Target = 80

RtGauge

DCA - Actual = 180.59

DCA - Target = 27

TTD - Actual = 145.40

TTD - Target = Calc Failed

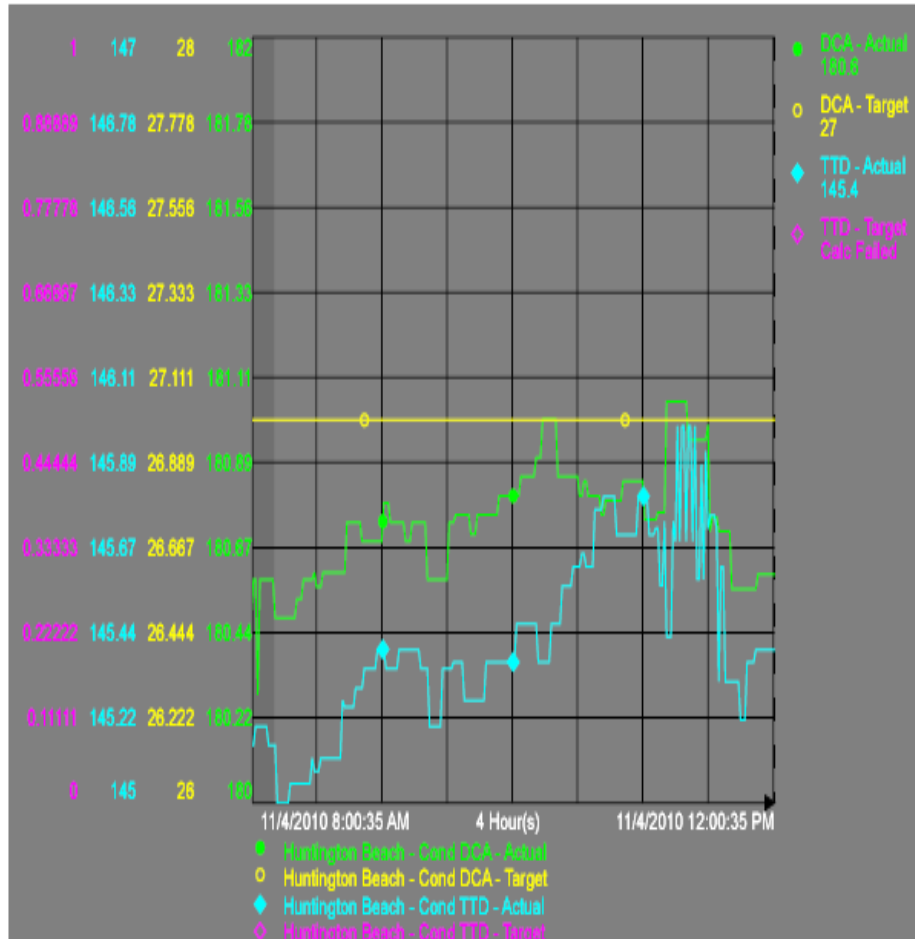
Trending and Historical Analysis



RtTrend



RtTimeRange



Start Time: *-4h

End Time: *

Apply

*-12h to * *-1d to * *-1w to *

RtTreeView

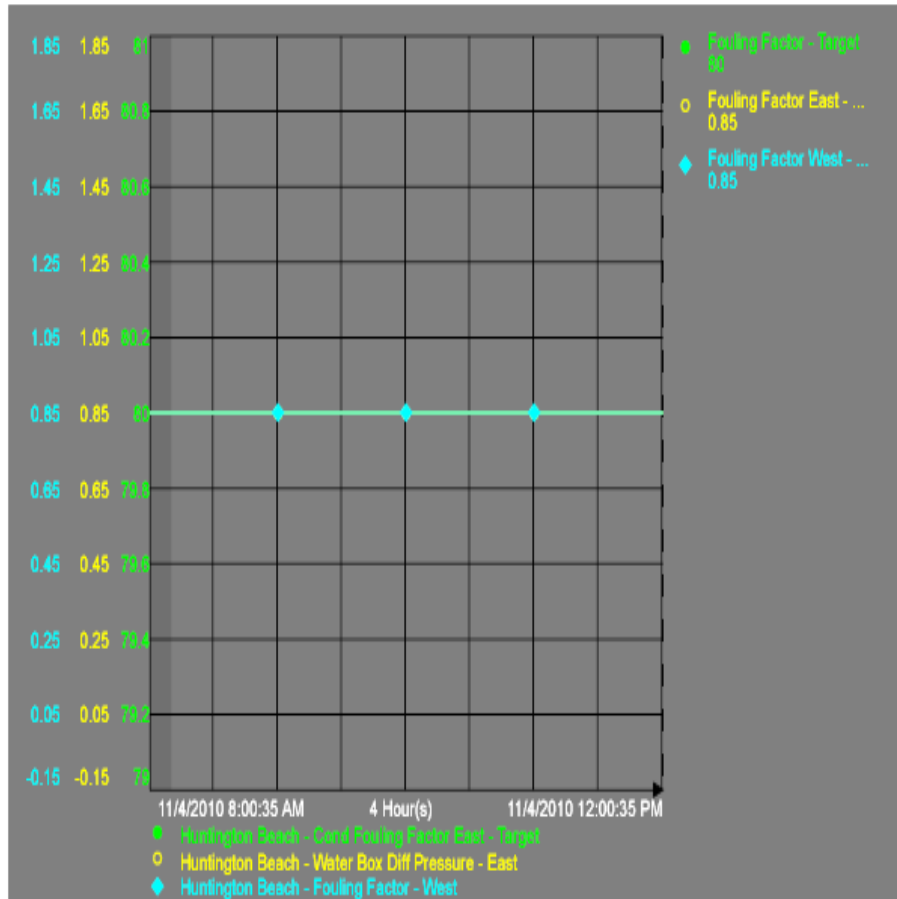


Use Alias

Huntington Beach, CA

Trending and Historical Analysis

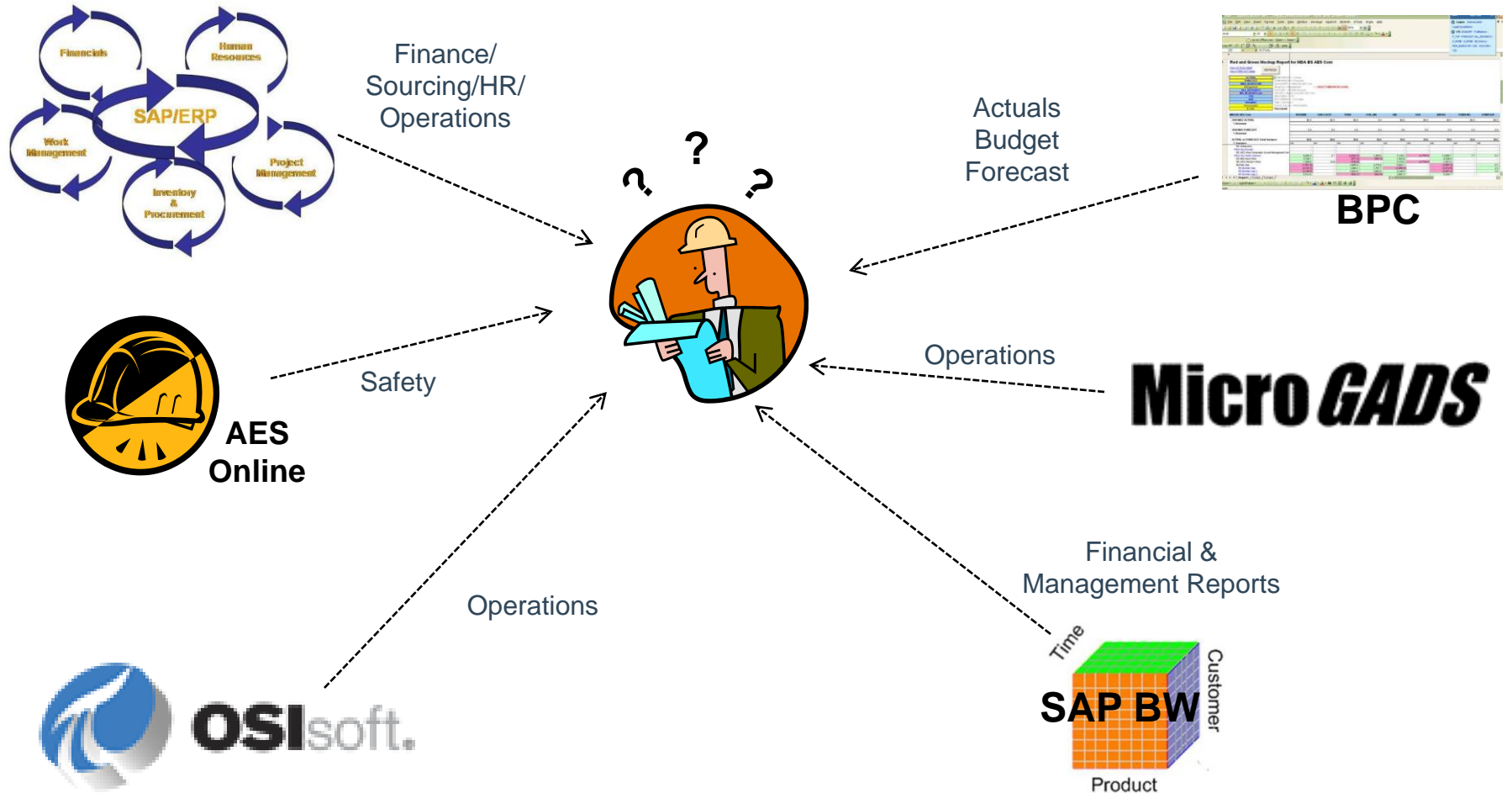
RtTrend



The AES Plant Manager Dashboard



How Do We Get More Out of What We Have?

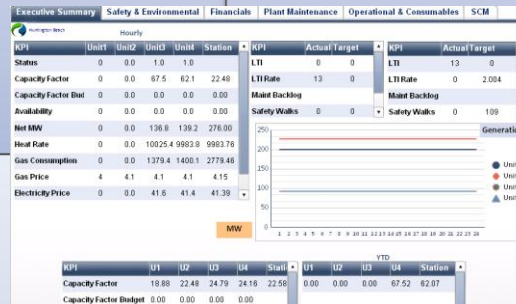


Vision

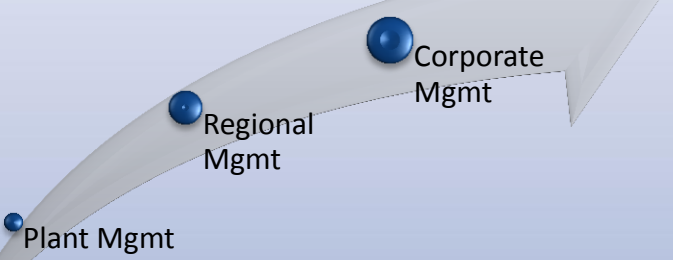
- Develop a functionally useful dashboard to enhance current plant management reports
- Deliver financial and operational information in “real-time”
- Leverage existing operational and financial data sources (e.g., SAP, PI and other plant data) without additional effort

KPI Areas Included

- Safety – Recordable Events, LTA, Safety Walks
- Environmental – Water and Air Exceedance
- Operational – Commercial Availability, EFOR
- Consumables – R/O Water, Hydrogen CCF
- Plant Maintenance – Schedule Compliance, Resource Utilization
- Financials –EBITDA, Cash-to-Corp, NFOM, PTC



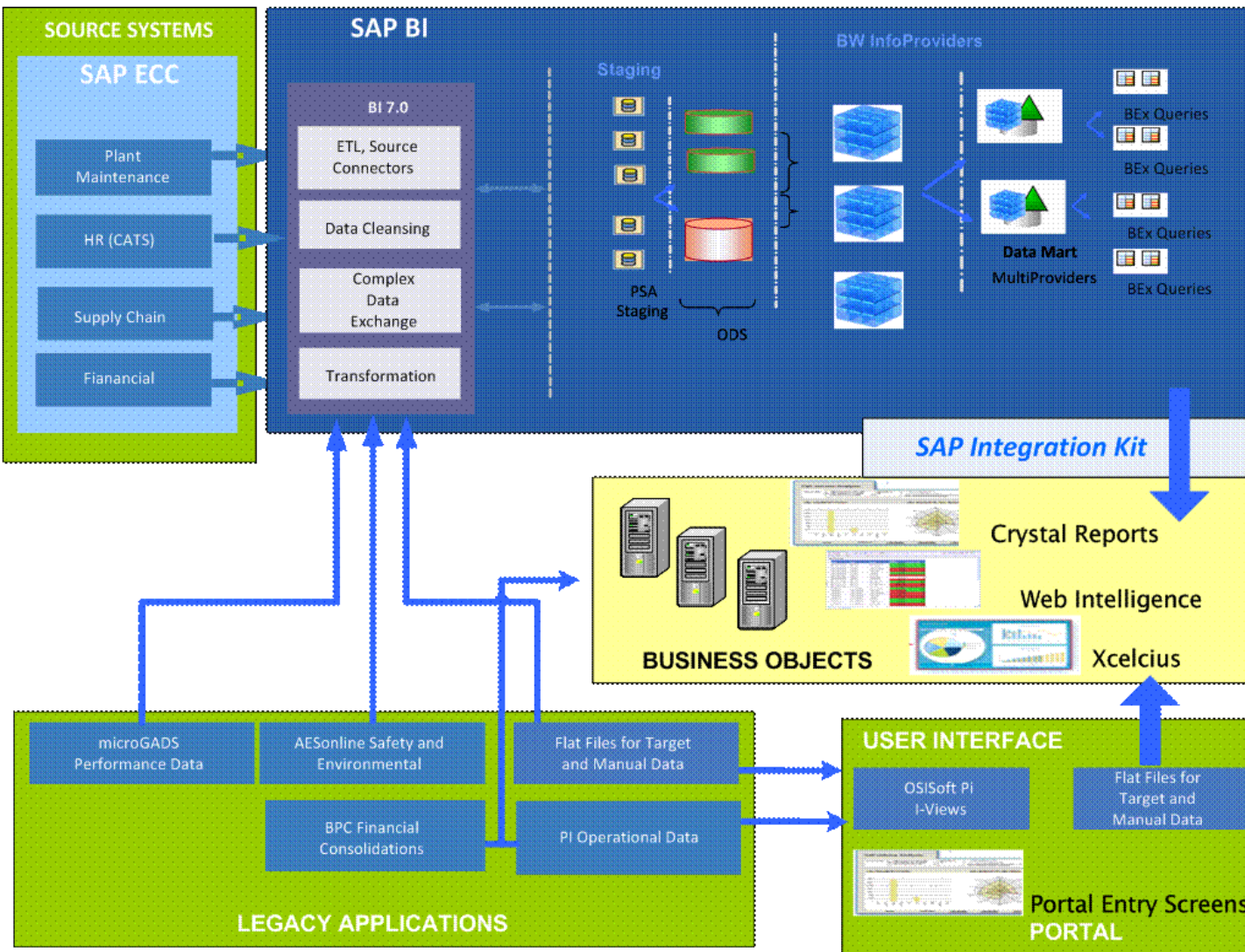
Users



Benefits

- Reduce effort and time to produce key operational and financial reports for plant management
- Increase accuracy of reporting data by integrating data to create a “single source of truth”
- Support analysis of leading indicators by reducing the time lag between an event and when we report on it – i.e. between action and reaction.

Plant Manager Dashboard Architecture



- The architecture presents data from 6 source systems
- SAP BW acts as the staging layer to the BOBJ Universe for 4 of the 6 source systems
- Reporting provided via Business Objects - Web Intelligence and formatted Crystal reports
- OSIsoft PI System data is a real-time update to the SAP Enterprise Portal

Executive Summary - 24 Hour real time trending and key operational KPIs



Executive Summary
Safety & Environmental
Financials
Plant Maintenance
Operational & Consumables
SCM

Hourly					
KPI	Unit1	Unit2	Unit3	Unit4	Station
Status (1- Online)	0	1	1	0	
CF %	0	42	27	0	17
CF Budget	0	0	0	0	0
Availability	0	0	0	0	0
Net MW	0	20	114	0	134
Heat Rate	0	10323	10000	0	10162
Gas Consumption	0	206	1145	0	1351
Gas Price	4	4	4	4	4
Production Cost	0	0	0	0	0

MTD			YTD		
KPI	Actual	Target	KPI	Actual	Target
LTI	0	0	LTI	0	0.0
LTI Rate	0	0	LTI Rate	0	0.0
Maint Backlog	4.8	5	Maint Backlog	5.2	5.0
Safety Walks	15	16	Safety Walks	114	144.0

KPI	MTD					YTD				
	U1	U2	U3	U4	Station	U1	U2	U3	U4	Station
CF %	4.2	4.2	5.1	15.5	7.3	45	50	20	18	33.3
CF Budget	26	28	25	25	26	45	50	20	18	33.3
Heat Rate	10080	10080	9950	9920	10008	10080	10080	9950	9920	10008
Gas Cons.(X 1K)	244	310	210	180	944	2440	3100	2100	1800	9440
CA	99.4	99.8	92	93.5	96.2	99.4	99.8	92	93.5	96.2
EFOR	0	0	0	0	0	0	0	0	0	0
Production Cost	0	0	0	0	0	0	0	0	0	0

Safety and Environmental - key Metrics from AES Online



Executive Summary | **Safety & Environmental** | Financials | Plant Maintenance | Operational & Consumables | SCM

Huntington Beach

KPI	UOM	MTD			YTD		
		Actual	Target	Var	YTD	Target	Var
Rec . IR	%	0	0	0	0	0	0
Recordable Events	#	0	0	0	0	0	0
LTI Events	#	0	0	0	0	0	0
Safety Walks	#	17	16	1	142	144	-2
LTI Incident Rate	%	0	0	0	0	0	0
Hear Misses	#	3	4	-1	24	32	-8
First Aids	#	0	0	0	0	0	0

Select MMM-YYYY

Sep-2010

KPI	UOM	MTD			YTD		
		Actual	Target	Var	YTD	Target	Var
Water Exceedance	#	0	0	0	0	0	0
Air Exceedance	#	0	0	0	0	0	0
Water Quality NOV	#	0	0	0	0	0	0
Air Quality NOV	#	0	0	0	0	0	0

Safety Near Misses

0 3 4

Safety Walks

0 17 16

Man-hours Worked Actual

148552

Financials - historical consolidation and SAP cost center detail; ability to toggle between forecast and budget



[Executive Summary](#) |
 [Safety & Environmental](#) |
 [Financials](#) |
 [Plant Maintenance](#) |
 [Operational & Consumables](#) |
 [SCM](#)

Huntington Beach Select MMM-YYYY
SEP - 2010

Prior Month Actual vs. Budget

KPI	UOM	Actual	Budget	Var	Forecast	Var
Pretax Contribution	K\$	3034.94	739.57	2295.37	1358.74	1676.20
EBITDA	K\$	9435.34	7653.67	1781.67	7821.37	1613.97
Total CapEx	K\$	1169.55	180.59	988.96	2515.39	1345.84
IFOM \$/KW-Yr	K\$	55.64	72.68	17.04	67.57	11.93
CWIP	K\$	51.60	51.60	0.00	51.60	0.00
AP Obligation	K\$	98.90	98.90	0.00	98.90	0.00

Yearly YTD Actual vs. Budget

YTD	Budget	Var	Frcst.	Var
236.73	236.73	57.69	307.74	71.02
735.96	735.96	596.99	956.74	220.79
91.22	91.22	14.09	118.59	27.37
4.34	4.34	5.67	5.64	1.30
4.02	4.02	4.02	5.23	1.21
7.71	7.71	7.71	10.03	2.31

- Data is based on Prior Month Values

MTD

Cost Elem. Categ.	UOM	Actual	Budget	Var	
Exec. Office	K\$	2145.71	5586.97	3441.26	↑
Ops. 1 & 2	K\$	602.15	94.03	-508.12	↓
Ops. 3 & 4	K\$	651.78	-665.98	-1317.76	↓
Mech. Maint.	K\$	2982.34	-810.25	-3792.59	↓
I & E Maint.	K\$	1053.17	-576.73	-1629.90	↓
Env/Safety/Eng.	K\$	1712.22	5608.85	3896.62	↑

YTD

Actual YTD	Budget YTD	Var	
9988.64	22588.64	12600.00	↑
771.75	320.46	-451.29	↓
2889.57	-2655.92	-5545.49	↓
4831.06	-4151.10	-8982.17	↓
2988.32	-2371.03	-5429.86	↓
7516.23	22674.57	15158.35	↑

Click on the Cost Element Category for Detail Information

Drilldown capabilities into cost center detail



Executive Summary | Safety & Environmental | **Financials** | Plant Maintenance | Operational & Consumables | SCM

Huntington Beach Select MMM-YYYY
SEP - 2010

Prior Month Actual vs. Budget							Yearly YTD Actual vs. Budget				
KPI	UOM	Actual	Budget	Var	Forecast	Var	YTD	Budget	Var	Frcst.	Var
Pretax Contribution	K\$	3034.94	739.57	2295.37	1358.74	1676.20	236.73	236.73	57.69	307.74	71.02
EBITDA	K\$	9435.34	7653.67	1781.67	7821.37	1613.97	735.96	735.96	596.99	956.74	220.79
Total	K\$	55.64	72.91	-17.27	77.51	21.72	5.64	5.64	5.64	5.64	1.30

Mechanical Maintenance Cost Elements

Cost Center	UOM	MTD			YTD		
		Actual	Budget	Var	Actual YTD	Budget YTD	Var
Mech. Maint - BOP	K\$	1522	-922	-2444	2629	-3689	-6318
Mech. Maint - Gen	K\$	575	449	-127	802	659	-144
Mech. Maint - U 1	K\$	186	98	-89	430	142	-288
Mech. Maint - U 1&2	K\$	214	281	67	-1352	367	1719
Mech. Maint - U 2	K\$	-2	3	5	834	620	-214
Mech. Maint - U 3	K\$	4	3	0	45	163	117
Mech. Maint - U 3&4	K\$	36	17	-19	346	501	155
Mech. Maint - U 4	K\$	447	-739	-1186	1097	-2914	-4011

Click on the Cost Element Category for Detail Information

Huntington Beach

KPI	UOM	MTD			YTD			Select MMM-YYYY SEP-2010
		Actual	Target	Var	Actual	Target	Var	
Schedule Compliance	%	70.0	80.0	10.0	58.2	80.0	21.8	
PM WO Compliance	%	23.0	58.0	35.0	58.4	58.0	-0.4	
Break In Work	%	92.0	63.0	-29.0	64.2	63.0	-1.2	
Unscheduled OT	%	61.0	83.0	22.0	70.6	83.0	12.4	

KPI	UOM	MTD			YTD		
		Actual	Target	Var	Actual	Target	Var
PM vs. Corr.	#	0	125	125	102	125	23
Unplanned WO	#	82	156	74	137	156	19
Hotif. w/o WO	#	114	137	23	124	137	13

Planned Hours: 4156

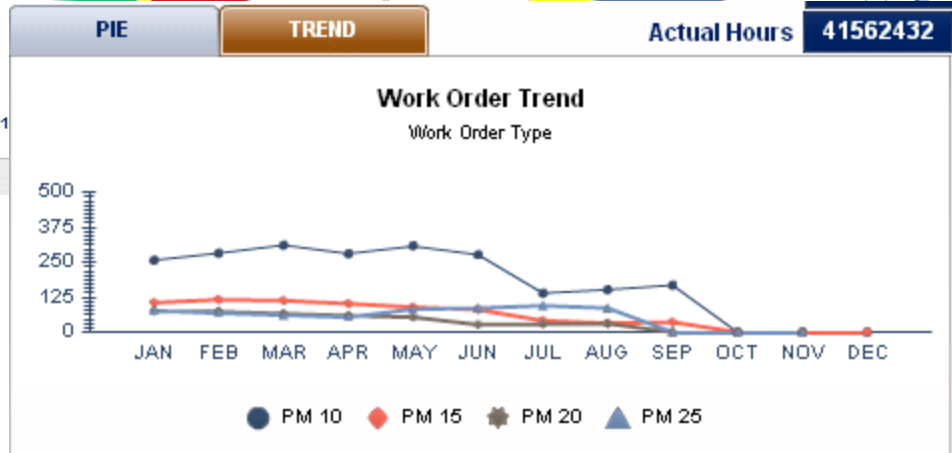
Actual Hours: 41562432

Efficiency: 60

Backlog Chart

Work Type

Priority Type



Executive Summary
Safety & Environmental
Financials
Plant Maintenance
Operational & Consumables
SCM

Station DrillDown

Station ▼

Monthly Actual Vs Target						YTD Actual vs. Target		
KPI	UOM	Actual	Target	Var		YTD	Target	Var
CA	%	21.27	0.00	21.27	⊕	3.5	0.0	3.5
HCF	%	30.79	0.00	30.79	⊕	116.8	0.0	116.8
EAF	%	97.45	0.00	97.45	⊕	85.6	0.0	85.6
EFOR	%	2.20	0.00	2.20	⊕	21.4	0.0	21.4
EFOF	%	1.90	0.00	1.90	⊕	10.6	0.0	10.6
ESOF	%	0.00	0.00	0.00	⊖	0.0	0.0	0.0

Select MMM-YYYY

AUG - 2010 ▼

Monthly Actual vs. Target					YTD Actual vs. Target		
Description	UOM	Actual	Target	Var	YTD	Target	Var
Start Ups	#	1	0	1	⊕	3	0
Unit Trips	#	0	0	0	⊖	0	0
Failed Starts	#	0	0	0	⊖	0	0

Hydrogen

650

1000

H2 Target

CCF

Nitrogen

1350

1000

N2 Target

CCF

R/O Water

1078

1000

R/O Water

Units

Urea

1200

1000

Urea

Ib/GW

Hydrogen	Nitrogen	R/O Water	Urea

Executive Summary | Safety & Environmental | Financials | Plant Maintenance | Operational & Consumables | **SCM**

Huntington Beach

MTD					YTD		
KPI	UOM	Actual	Target	Var	Actual	Target	Var
Inventory Value	K\$	1130	1100	-30	1130	1100	-30
Inventory Turns	%	33	30	-3	33	30	-3
Stock to Hon Stock	%	75	80	5	75	80	5

MTD				YTD		
	Actual	Target	Var	Actual	Target	Var
Sourcing Savings	23918	23918	0	56655	56655	0

Sourcing Savings					Select Date
Description	Quarter	Spend	Savings	Savings %	2010
WIPRO Technologies	3	69526	32737	47	
OSI Soft	3	10	3550	90	

MTD				YTD		
	Requisition	Purchase Order	% PO vs PR	Requisition	Purchase Order	% PO vs PR
No of Documents	29	99	29	141	604	23

Invoice Aging	UOM	Current	30 - 60	60 - 90	> 90
Invoice Count	#	75	36	3	0
Invoice	k\$	140	23	10	0

- Transforms data into more useful business information
- Provides timely data to improve the quality of business decision making
- Supports prioritization of work activities based upon performance, risk assessment and related KPIs
- Reduces overall effort required for reporting
- Provides a single version of the truth with all levels of management having access to the same information
- Helps to streamline management practices



Thank you

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