O&M Value discovery through PI

Optimizing objectives, Integrating solutions.

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VCS
the growth catalyst

Contents

The Opportunity

- Energy cost reduced by 3-5%
- Shorter Start up phase 5 to 20% faster
- Off Quality product improved by 30%
- Dramatically improved consistency of Quality
- Increased first pass Quality
- Eliminate Raw material management errors
- Payback in One year

Contents

How to Realize

- Make data actionable
- Accelerate root cause analysis and corrective action
- Make faster and better decisions
- Leverage skills and lower costs by delivering information to experts
- Kaizen way of life for continuous improvement
- Improve decision support, operating performance, cost efficiency and customer service by real time data analytics and operational insights
- Capture Best demonstrated practice and extend BDP production
- Capture manufacturing and equipment knowledge in the system

Becoming more competitive

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Traditional Operating Processes

- Hidden information, problems
- Data in many locations & not easily accessible
- Multiple versions of the truth
- IT drives initiatives with lower acceptance in production
- Production driven initiatives with lack of IT know how, Enterprise vision

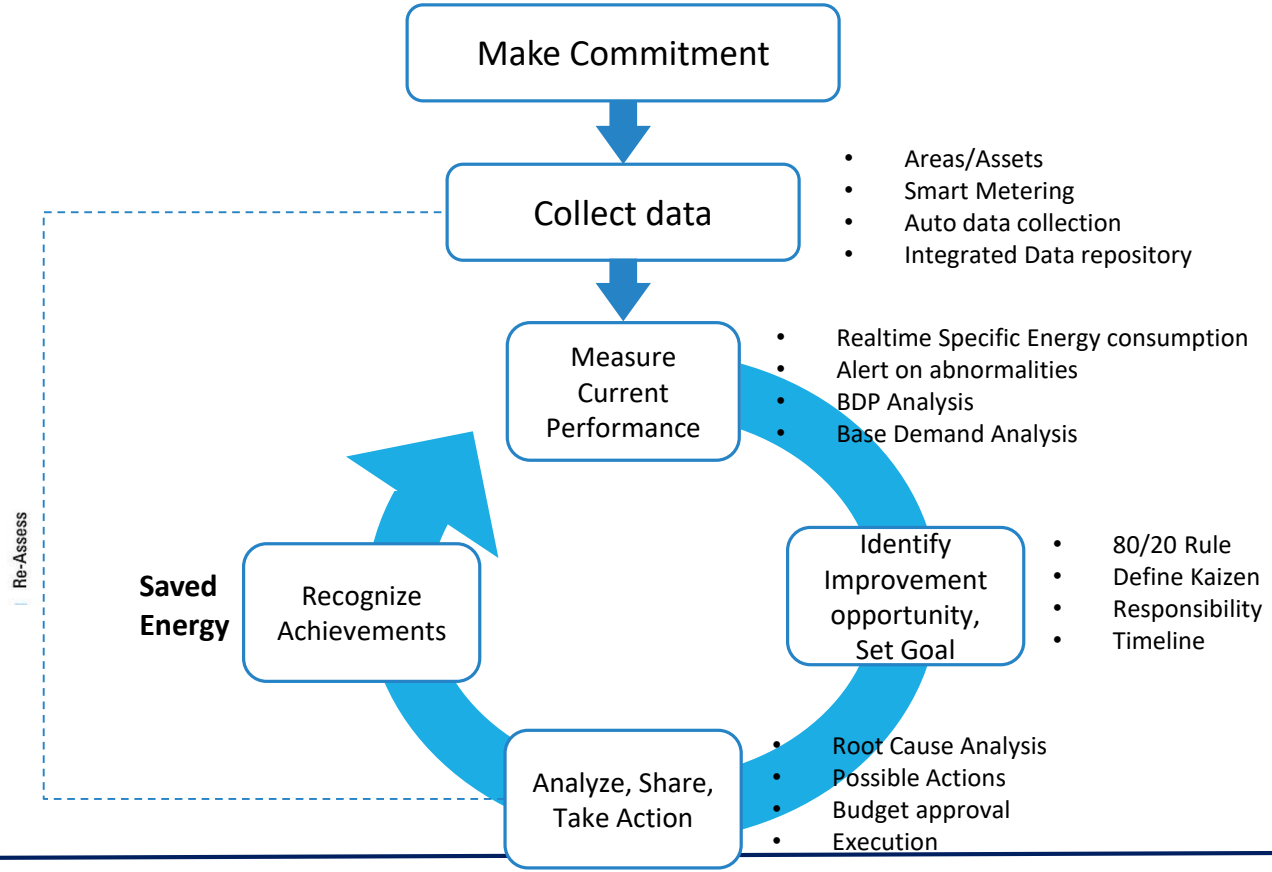
Operational Intelligence Concepts

- Common platform, Standardized Data Model, analysis
- Critical Equip Management thro' CBM
- Stabilizing Operations through NOx, COx, Temp, Vibrations management
- Reliability-Centred Maintenance
- Spares management – Grinding media, Gears
- Staff competencies

Operational Excellence in the 21st Century

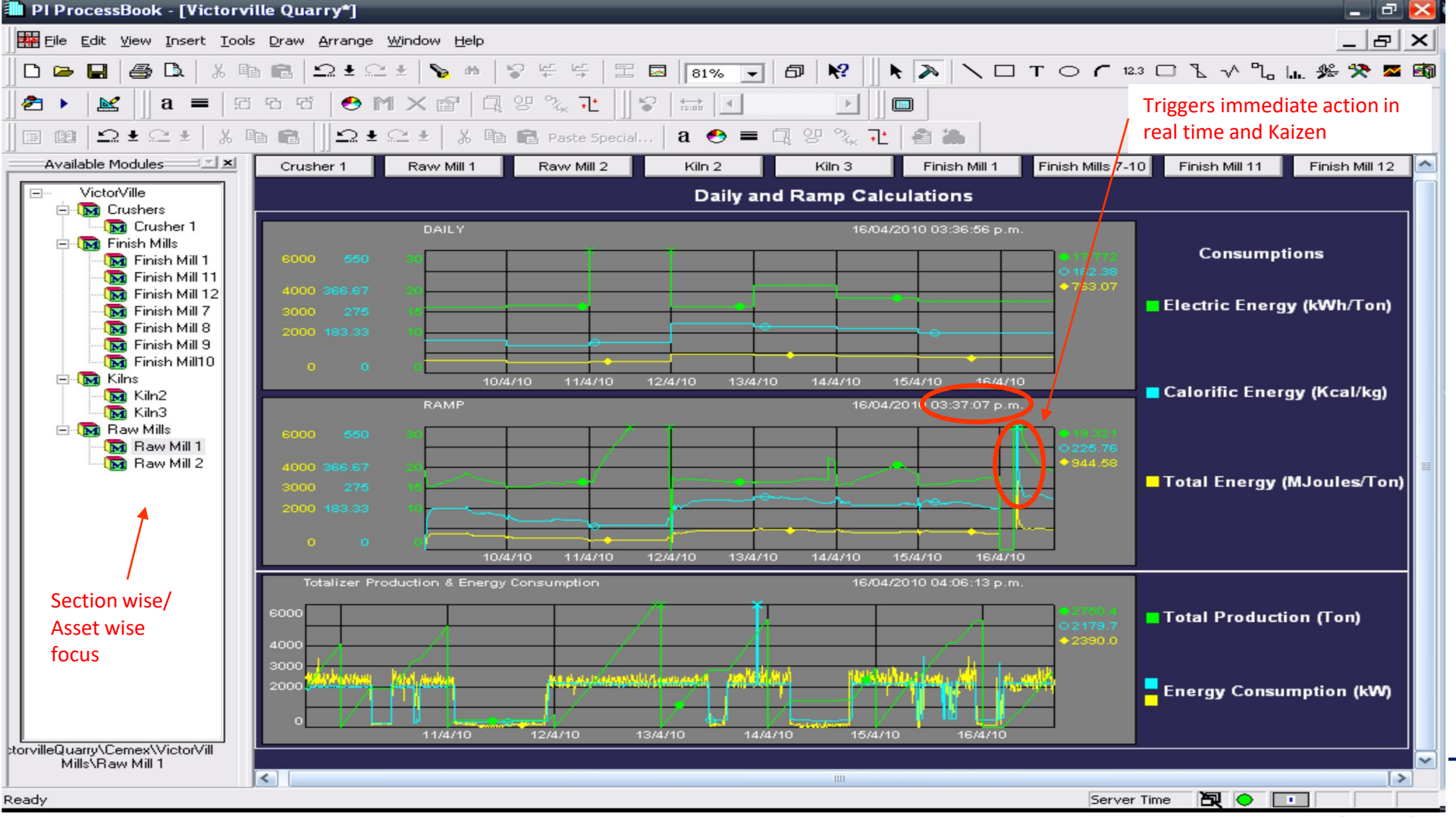
- IT create data infrastructure
- Production teams participate in Proactive problem solving
- Process modeling & improvements by Production/ SMEs
- Benchmarking and extension of best practices to other plants where IT facilitates

Realtime Energy Management Program: Improvement Cycle



Extracting value from EMS and data infrastructure

Contents

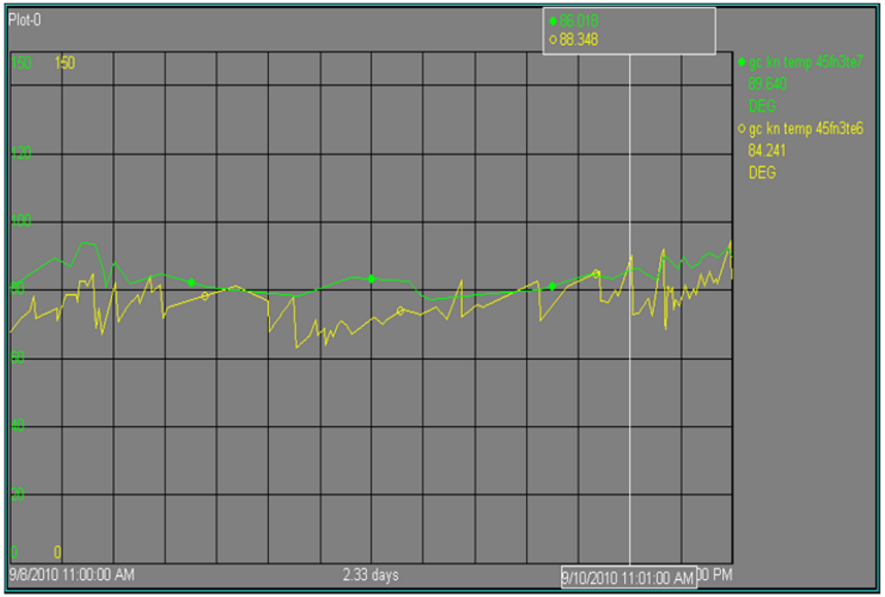

PI ProcessBook - [Victorville Quarry*]
File Edit View Insert Tools Draw Arrange Window Help
Triggers immediate action in real time and Kaizen
Available Modules
VictorVille
Crushers
Crusher 1
Finish Mills
Finish Mill 1
Finish Mill 11
Finish Mill 12
Finish Mill 7
Finish Mill 8
Finish Mill 9
Finish Mill10
Kilns
Kiln2
Kiln3
Raw Mills
Raw Mill 1
Raw Mill 2
Section wise/ Asset wise focus
Crusher 1
Raw Mill 1
Raw Mill 2
Kiln 2
Kiln 3
Finish Mill 1
Finish Mills 7-10
Finish Mill 11
Finish Mill 12
Daily and Ramp Calculations
DAILY
16/04/2010 03:36:56 p.m.
RAMP
16/04/2010 03:37:07 p.m.
Totalizer Production & Energy Consumption
16/04/2010 04:06:13 p.m.
10/4/10
11/4/10
12/4/10
13/4/10
14/4/10
15/4/10
16/4/10
Consumptions
Electric Energy (kWh/Ton)
Calorific Energy (Kcal/kg)
Total Energy (MJoules/Ton)
Total Production (Ton)
Energy Consumption (kW)
Ready
Server Time

Occurrence: Unexpected behavior after plant shutdown

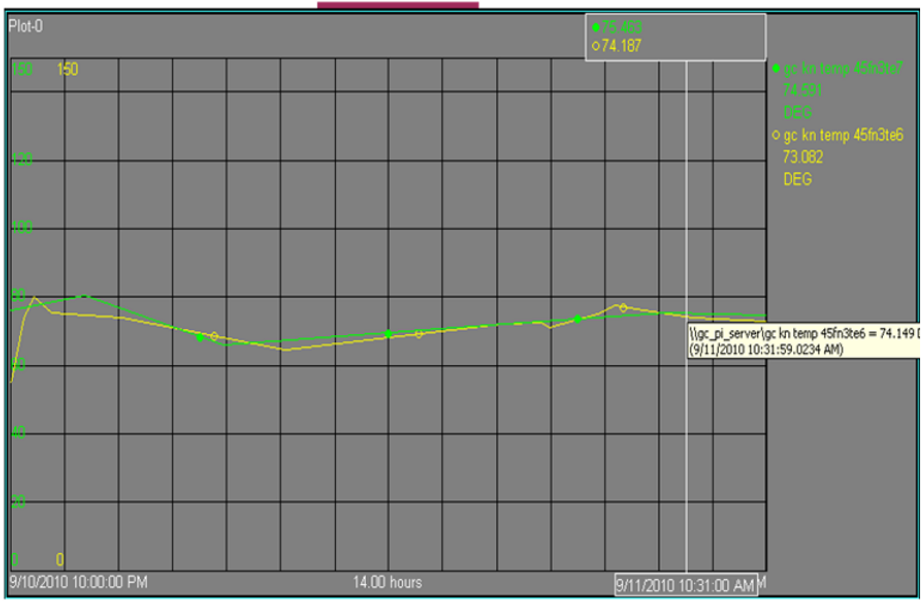
Observation: COOLER EXHAUST FAN BEARING TEMPERATURE HIGH

1

BEFORE



AFTER



Analyzing Parameters: Through PI System data was used to analyse the situation

Example

Possible Reason 1: Fan Balancing problem – No (Vibration Normal).

Possible Reason 2: Lubrication system problem – No.

Possible Reason 3: External Cooling (Water & Air) – Not Effective.

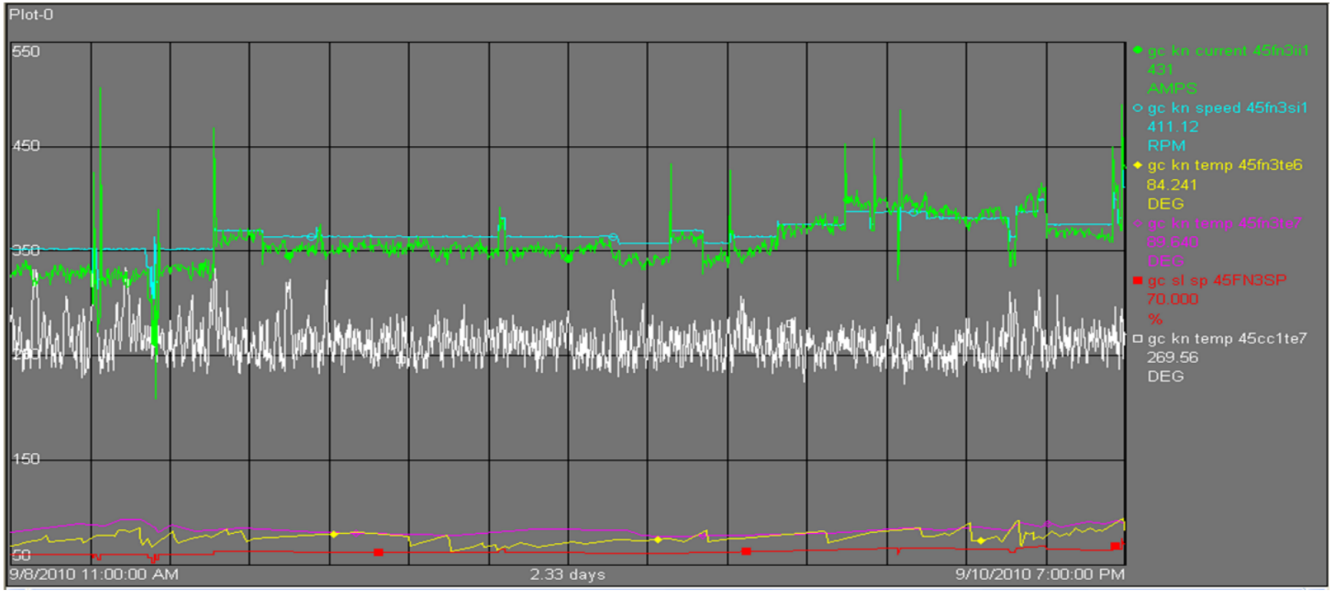
Possible Reason 4: Cooler Exhaust Temperature High – No.

WHAT WAS THE ACTUAL REASON FOR TEMPERATURE RISE?

PI System data was used to study the system .

Example

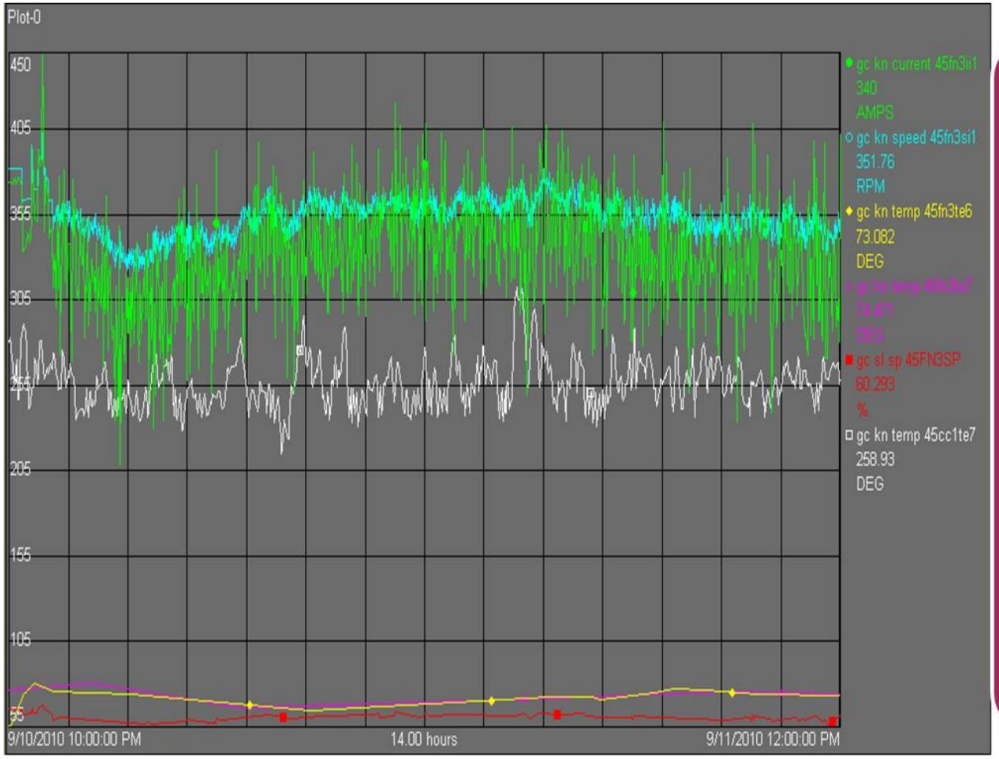
NEXT STEP: Data Analysis through PI ProcessBook



Conclusion: Though PI system only it was possible to analyze the system and overcome the problem. Additional air flow in system, due to damper opening up to 70% was causing process disturbances .

Example

RESULT: DATA ANALYSIS THROUGH PI ProcessBook



After calculation at Present gas temperature 250 C – 260 c the calculated gas density is 0.67 Kg/m^3, which ultimately increases the mass of gas.

Example

RESULT: Data Analysis Through PI ProcessBook

DATE		
TIME	11AM TO 7PM	10PM TO 12 PM
CURRENT	431	340
RPM	411	352
DE TEMP.	84 (with external cooling)	72
NDE TEMP.	89.9 (with external cooling)	74
GAS TEMP.	270	259
PID OPERATION	MANUAL	AUTO
EXT. COOLING	YES	NO
SET POINT (RPM)	70%	60.3%

Advantage: Through PI System data it was possible to study the **"System as a whole"**

Example: Compressor Run hours, PI Analysis, Notification and Action

Analyzing parameters:

2

- Compressor running hours average taken for one month
- Header compressed air pressure average taken for one month

Observations:

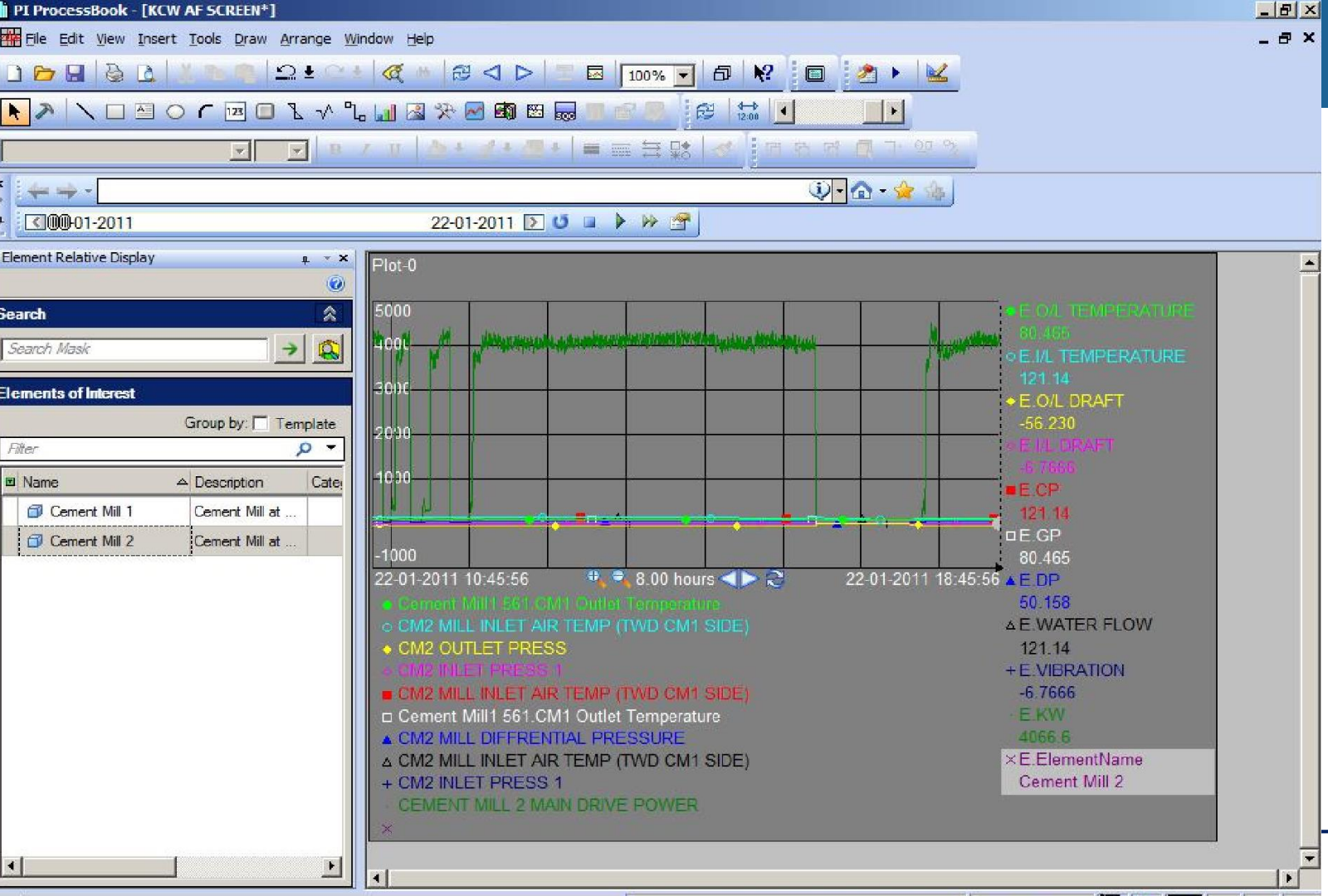
- 5 Compressor running for more than 23 hrs average
- Average comp. Air pressure found to be above 6.0 kg/cm2

Action :

- 1 compressor taken in auto start and stop in PLC to maintain header pressure of 5.5 kg/cm2

Benefit :

- 100-125 Running Hrs saved in a month



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Example: Modification of cooler fans' inlet Bell Mouth reduced suction pressure from 10 to 4 mbar because of less resistance

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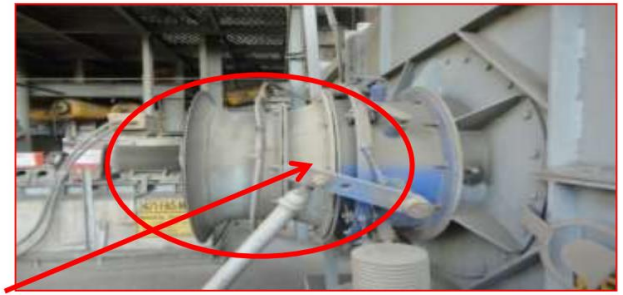
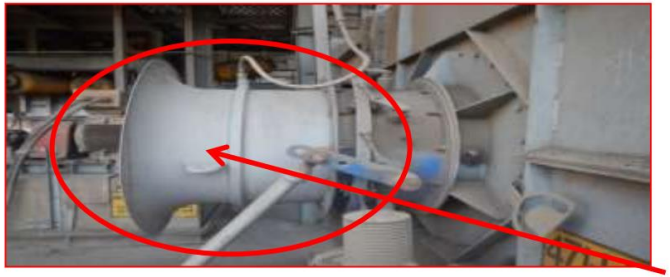
Achieved energy saving of 232 Kwh/day



Before modification

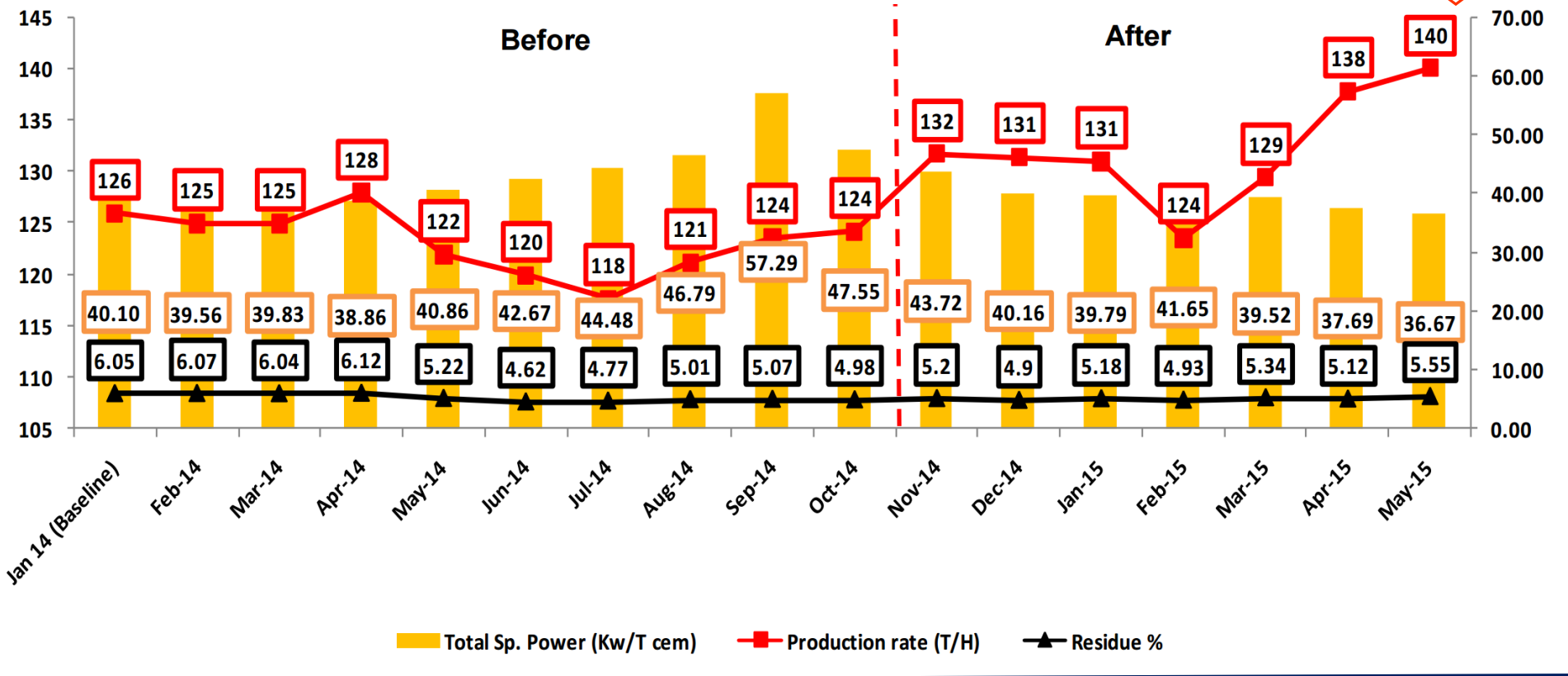
Increased pressure drop across fan, because of small diffuser placed



After modification

Decreased pressure drop across fan, By installing new bell mouth

Example


Before
After
145
140
135
130
125
120
115
110
105
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
126
125
125
128
122
120
118
121
124
124
132
131
131
124
129
138
140
40.10
39.56
39.83
38.86
40.86
42.67
44.48
46.79
57.29
47.55
43.72
40.16
39.79
41.65
39.52
37.69
36.67
6.05
6.07
6.04
6.12
5.22
4.62
4.77
5.01
5.07
4.98
5.2
4.9
5.18
4.93
5.34
5.12
5.55
Jan 14 (Baseline)
Feb-14
Mar-14
Apr-14
May-14
Jun-14
Jul-14
Aug-14
Sep-14
Oct-14
Nov-14
Dec-14
Jan-15
Feb-15
Mar-15
Apr-15
May-15
Total Sp. Power (Kw/T cem)
Production rate (T/H)
Residue %

Example

Sr No.	Actions taken
1	Media pattern change, increased finer ball charge in 2nd chamber
2	Replacement of Worn out intermediate diaphragm plates, Separator static & rotor vanes
3	Sepol inlet duct air guide vanes adjusted.
4	Sepol bag filter exit & Fresh air blancing done to get max. separation efficiency.
5	Regular Inspection of Separator fan & cleaning of inlet box.
6	Regular Inspection of BE lip plate for any recirculation.
7	Mill discharge hood modification to increased fineness of bag filter product .
8	Hood arrangement for all aux. equipment venting

Example: General Maintenance Practice

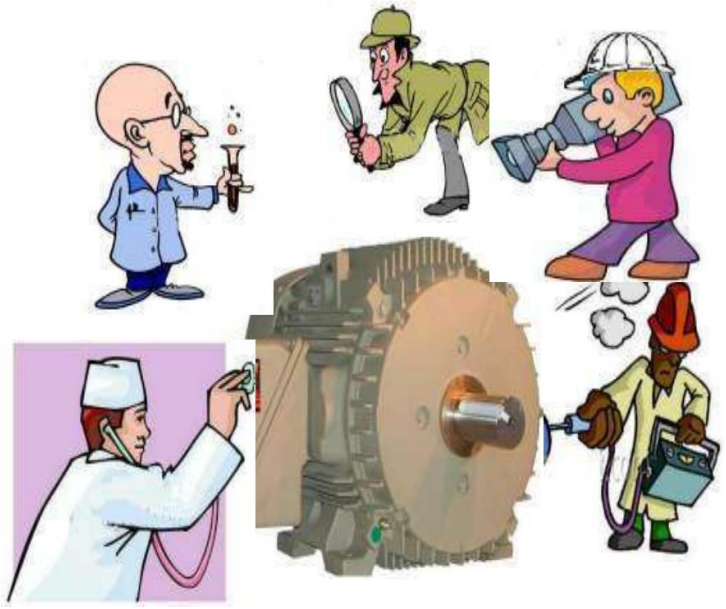
5

Daily Walk-by Inspection

- Simple visual, audible, smell and touch inspection of the equipment or area
  - Reading parameters, such as vibration, voltage, current, fault messages etc.
  - Observing items such as slip ring-carbon brush contact on MV motors
- Blowering, cleaning, greasing, oiling and also finding out the abnormal condition of the equipment.
- Sharing information to the internal and external customer

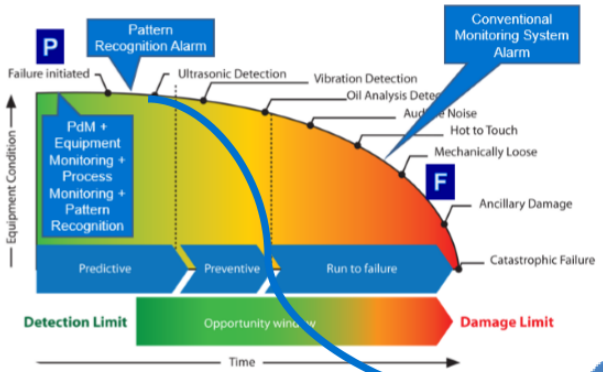
Condition Based Maintenance

Continuous monitoring of key tags by PI and sending notifications

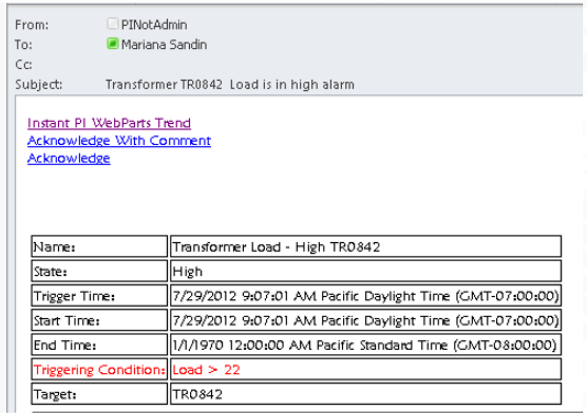


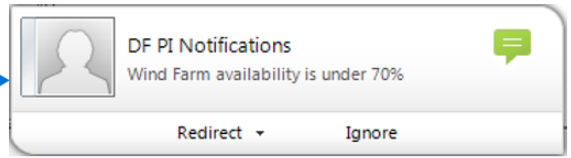
- **Vibration Monitoring & analysis of major drives**
- **Oil analysis of all Power & Distribution Transformer**
- **IR/PI Value Testing of Electrical Equipments**
- **Protection Relay Testing during annual shutdown .**
- **Overhauling of HT/LT Motors during annual shutdown as per Conditioning Monitoring Report therefore no motors failures during last 3-4 yrs**
- **Thermography of LT switch gears done & its point attended.**
- **HT/LT Switchgears Maintenance during annual shutdown.**

Introducing PI Notifications



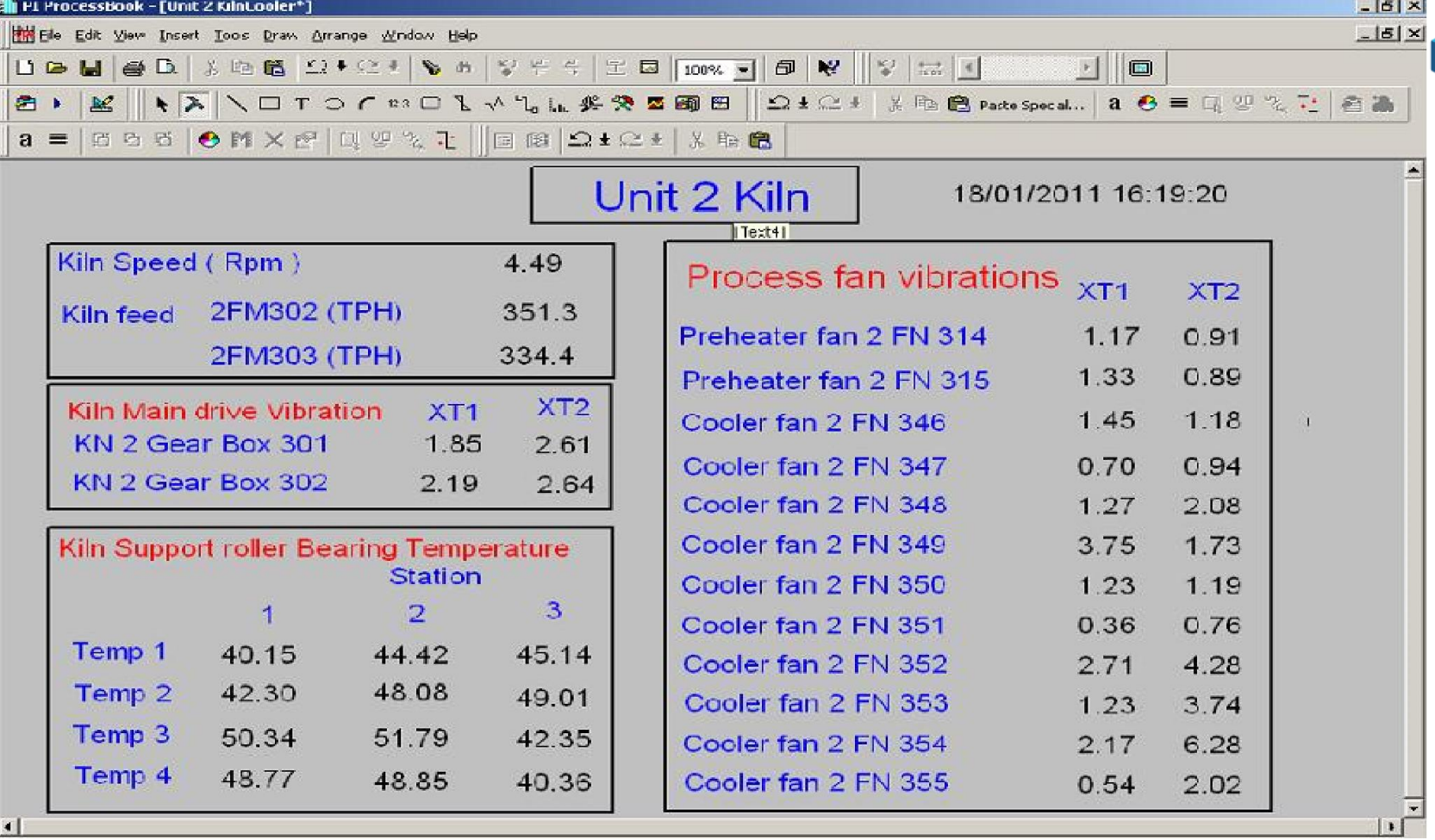
PI Notifications





Web Service / XML

CMMS / Maintenance System



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Condition Based Maintenance

OSIsoft.

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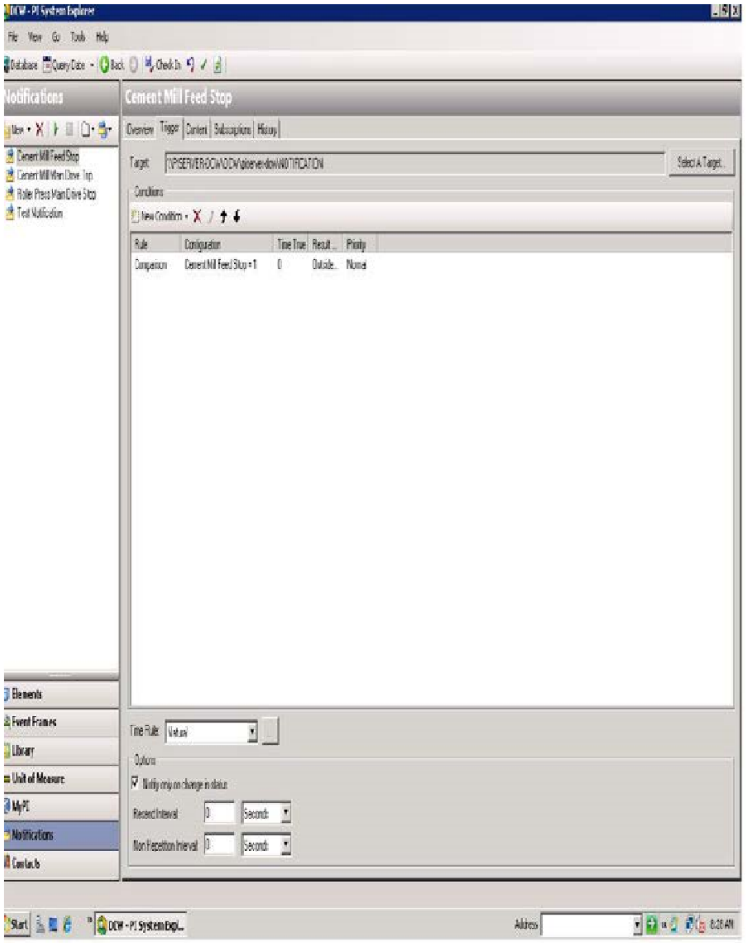
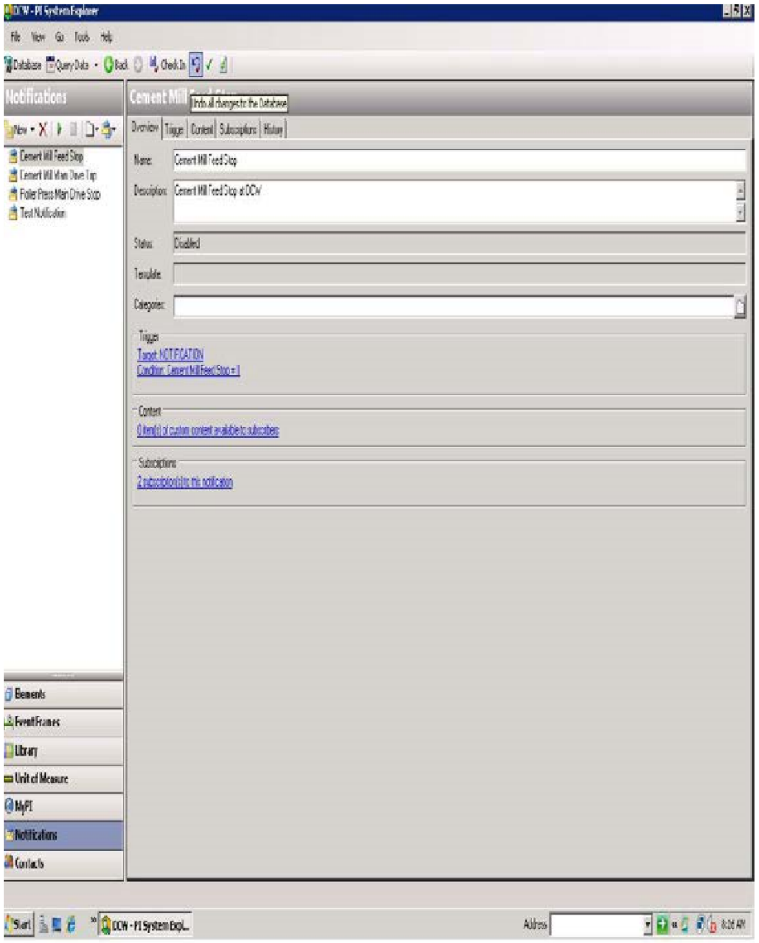
Kiln - Unit 1

Sl. No	PI Tag No	Descriptor	Eng Unit	Alarm 1	Alarm 2	Trip	Time of best achieved	Best achieved	1	2	3
Kiln support Rollers											
1	ACS KN TEMP KILN ROLLER1 1	KILN ROLLER BEARING STATION 1 TEMP-1	0C	55	68		13-Jan-10 11:42:39	41.5	45.6	47.1	45.9
2	ACS KN TEMP KILN ROLLER1 2	KILN ROLLER BEARING STATION 1 TEMP-2	0C	55	68		14-Jan-10 11:39:56	31.7	43.1	44.1	41.6
3	ACS KN TEMP KILN ROLLER1 3	KILN ROLLER BEARING STATION 1 TEMP-3	0C	55	68		14-Jan-10 11:39:56	33.3	43.2	45.8	42.8
4	ACS KN TEMP KILN ROLLER1 4	KILN ROLLER BEARING STATION 1 TEMP-4	0C	55	68		14-Jan-10 11:39:56	34.9	48.7	48.4	47.9
Kiln main drive & Girth gear											
5	ACS KN TEMP KN301 MTR DE BRG	KILN MTR 301 DE BRG	0C	75	95		08-Mar-10 07:31:48	40.5	49.3	49.4	48.1
6	ACS KN TEMP KN301 MTR NDE BRG	KILN MOTOR 301 NDE BRG TEMP	0C	85	95		14-Jan-10 03:09:28	40.2	62.1	62.3	59.2
7	ACS KN TEMP KN301 GB 1	KILN GEAR BOX TEMPERATURE - 1	0C	75	90		10-Jan-10 05:24:30	52.2	60.1	57.8	55.4
8	ACS KN TEMP KN301 GB 2	KILN GEAR BOX TEMPERATURE - 2	0C	75	90		07-Aug-10 16:19:43	47.6	45.3	44.0	42.5
9	ACS KN TEMP KN301 GB 3	KILN GEAR BOX TEMPERATURE - 3	0C	75	90		14-Jan-10 11:39:56	58.5	62.0	61.9	59.8
10	ACS KN TEMP KN301 GB 4	KILN GEAR BOX TEMPERATURE - 4	0C	75	90		14-Jan-10 11:39:56	58.7	64.6	64.9	63.6

Better Alarm 1 Alarm 2 Trip



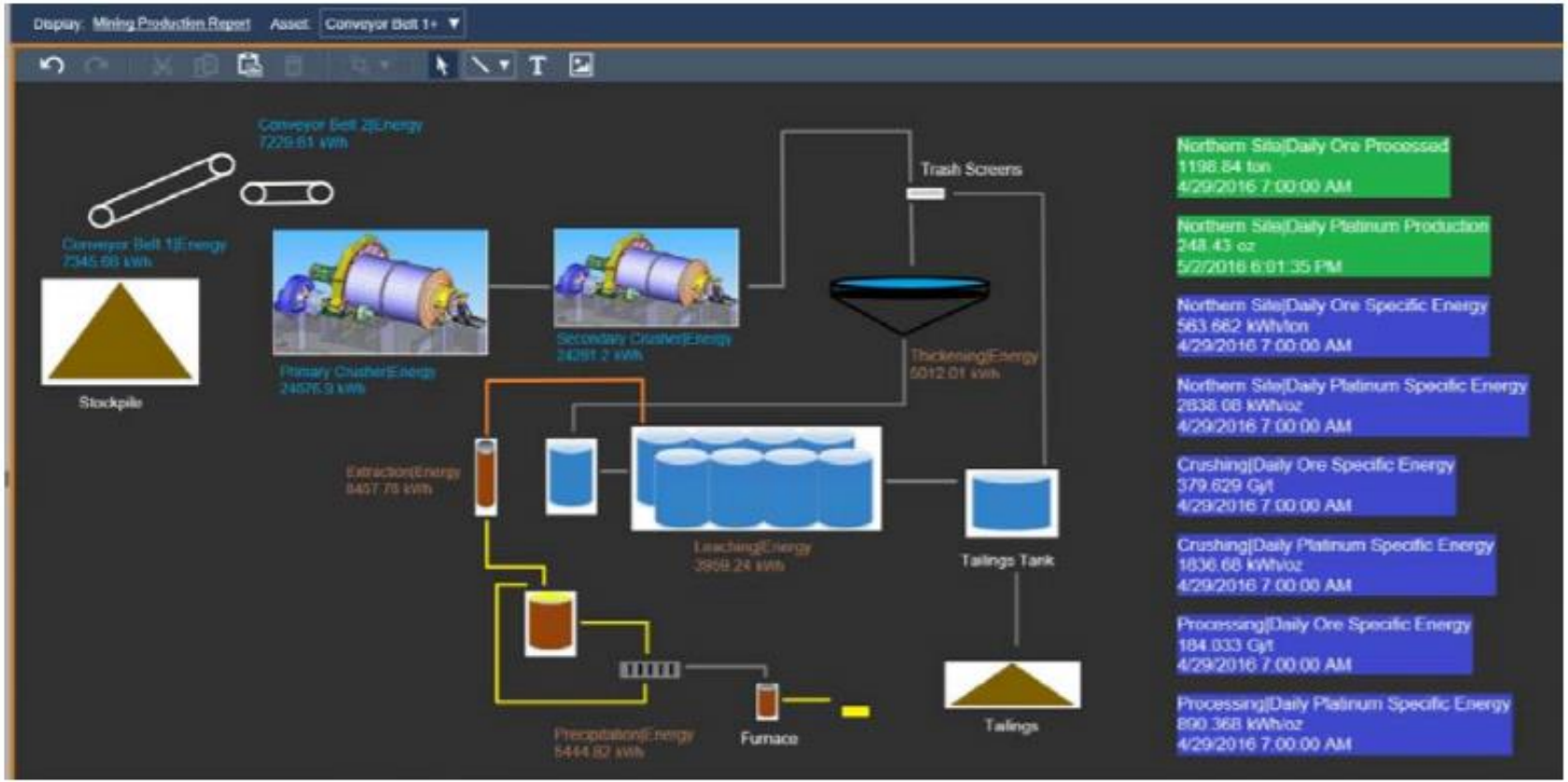


Notification to the concerned Based on Critical condition through Email

Stand-Alone Meters are not enough

- Generally provide only Raw Data
- Readings cannot be correlated on-line,
  in Real-Time
- Difficult to relate Energy Consumption to production
- Optimisation requires On-Line Data. Difficult to achieve with Stand-Alone Instruments.

Site level energy Consumption



Site level Energy Consumption report

Current Month Platinum Production (oz)

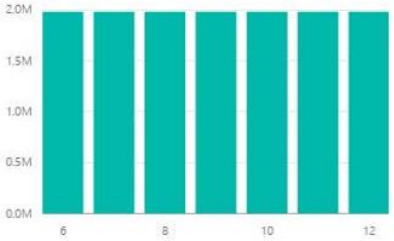
Average Platinum Specific Energy (kwh/oz)

2,666

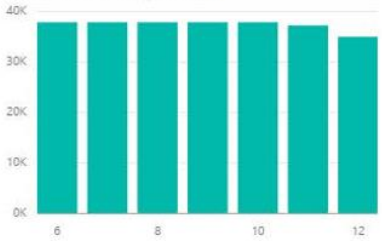
Average Ore Specific Energy (kwh/ton)

3,948

Energy Consumption by Day (kwh)



Electric Cost by Day ($)



Year	Month	Day	Energy_Base_Process.Daily Dollar Per Oz	Energy_Base_Process.Daily Energy Consumption	Energy_Base_Process.Daily Electric Cost
2016	April	1	43.62	674,916.69	12,831.90
2016	April	2	51.28	675,443.50	12,634.23
2016	April	3	50.54	675,510.06	14,784.24
2016	April	4	59.07	675,098.06	13,720.14
2016	April	5	55.31	674,965.56	12,853.84
2016	April	6	51.12	674,965.56	12,853.83
2016	April	7	51.62	674,965.56	12,853.83
2016	April	8	52.25	674,965.56	12,853.83
2016	April	9	51.10	675,227.75	15,945.81
2016	April	10	62.10	679,163.13	13,939.26
Total			**642.09**	**8,112,622.19**	**162,653.67**

Energy_Base_Site

- Northern Site
- Plata Site
- Southern Site

Realtime Energy Management System

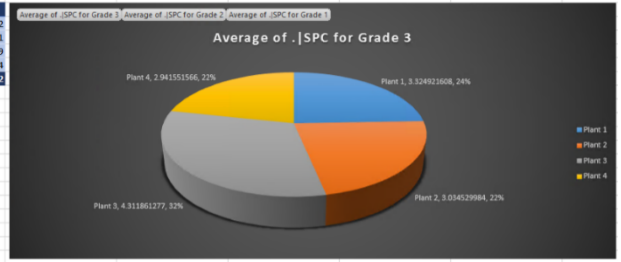
Grades	Run Hours (hours)	Specific Energy Consumption (kWh)	Specific Production (tonne)	Specific Power Consumption (kWh/tonne)
Grade 1	19.34	19409.43	290.43	66.83
Grade 2	2.74	2745.55	771.58	3.56
Grade 3	1.92	1931.88	2579.81	0.75

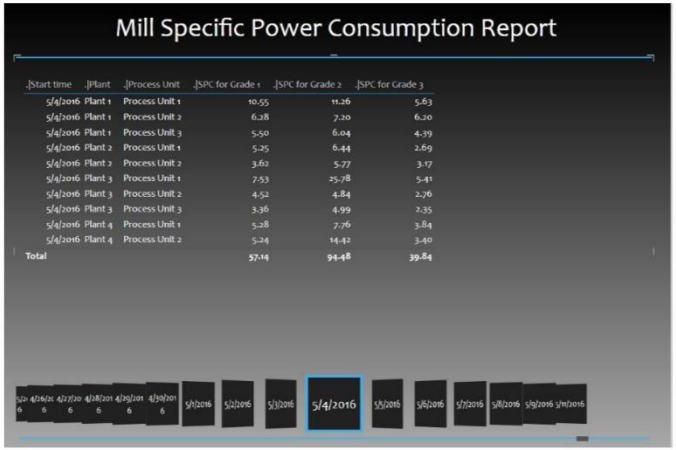
TimeRange	Run Hours (hours)	Specific Energy Consumption (kWh)	Specific Production (tonne)	Specific Power Consumption (kWh/tonne)
07-Apr-16 00:00:00	12.38	12244.02	4238.96	2.89
08-Apr-16 00:00:00	14.65	14236.35	3165.40	4.50
09-Apr-16 00:00:00	0.08	81.49	23.00	3.54
10-Apr-16 00:00:00	4.73	4826.68	992.26	4.86
11-Apr-16 00:00:00	0.88	859.73	273.01	3.15
12-Apr-16 00:00:00	8.43	8730.64	2000.13	4.37
13-Apr-16 00:00:00	13.82	12997.32	5913.81	2.20
14-Apr-16 00:00:00	5.17	5558.75	2045.30	2.72
15-Apr-16 00:00:00	10.99	11717.13	2945.07	3.98
16-Apr-16 00:00:00	2.27	2333.23	905.89	2.58
17-Apr-16 00:00:00	10.45	9839.16	4784.32	2.06
18-Apr-16 00:00:00	4.66	4780.38	1939.93	2.46
19-Apr-16 00:00:00	13.04	12744.24	4355.40	2.93
20-Apr-16 00:00:00	3.88	4045.13	692.45	5.84
21-Apr-16 00:00:00	1.77	1896.16	759.26	2.50
22-Apr-16 00:00:00	0.21	232.53	72.08	3.23
23-Apr-16 00:00:00	3.50	3756.52	525.24	7.15
24-Apr-16 00:00:00	6.72	7073.09	2166.20	3.27
25-Apr-16 00:00:00	0.56	626.39	175.94	3.56
26-Apr-16 00:00:00	7.20	6640.81	1756.46	3.78
27-Apr-16 00:00:00	11.13	12764.11	4278.35	2.98

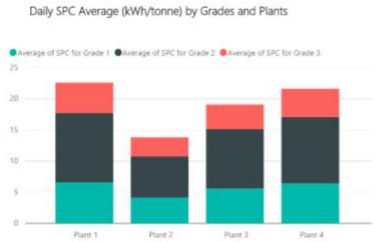
Realtime Energy Management System : KPI

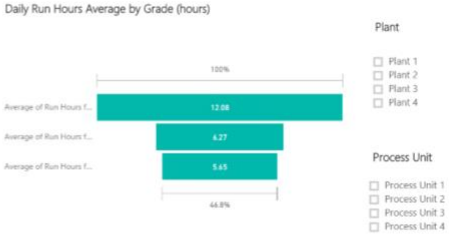
Detecting High Performing Plant (one that has low SPC %) sorted by grades

Row Labels	Average of .|SPC for Grade 3	Average of .|SPC for Grade 2	Average of .|SPC for Grade 1
Plant 1	3.324921608	7.300213814	4.303674062
Plant 2	3.034529984	4.944565058	4.052906811
Plant 3	4.311861277	10.12102234	5.139013529
Plant 4	2.941551566	6.064894676	4.341163874
Grand Total	3.561306639	7.673059117	4.568656152









Advantages / Benefits Pre vs Post Scenario

Parameters	As Is	To Be
Data collection	Manual	Automated
Live data / real-time information	Not available	Readily available
Data integrity	Lack of / questionable data integrity	Authentic and reliable data
Reporting	Manually generated	System generated
Knowledge base	Plain datasets	Analytical information
Benchmarking	No benchmarks	Benchmarking with historical performances
Comparison across plants	Not possible	Easily possible
Analytical work	Laborious and cumbersome	Smooth and easy
Manual Man-hours	Very High	Effectively nil
Status update	Through emails / phone calls	Auto triggered alerts / SMSs

Example: Optimization of Compressors

Energy saving by optimizing compressors for pre-clinkerization & post-clinkerization by centralizing the compressors in their respective headers with installation of Intelligent flow controllers.

Godrej IFC installed at the outgoing lines after the Air dryers to control the flow & maintaining the constant pressure in the application within the variation of 1 psig. This system facilitate to run the compressor in a very optimized way by maintaining desired air pressure.

This system prioritizes & sequences the compressors according to their efficiency, thus reducing the loss of productive energy. Through this system all the compressors can be controlled & operated from desk.

Example

	POST -CLINKERISATION	PRE-CLINKERISATION
Daily energy saving achieved	1388.61 KWh/day	1826.85KWh/day
Energy saving per year	458241.3KWh/year	602860.5KWh/year
% Energy savings achieved	11.36%	12.29%

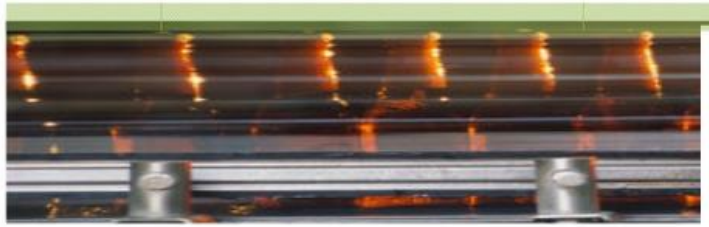
PI in Cement – Key Savings

LAFARGE

Holcim

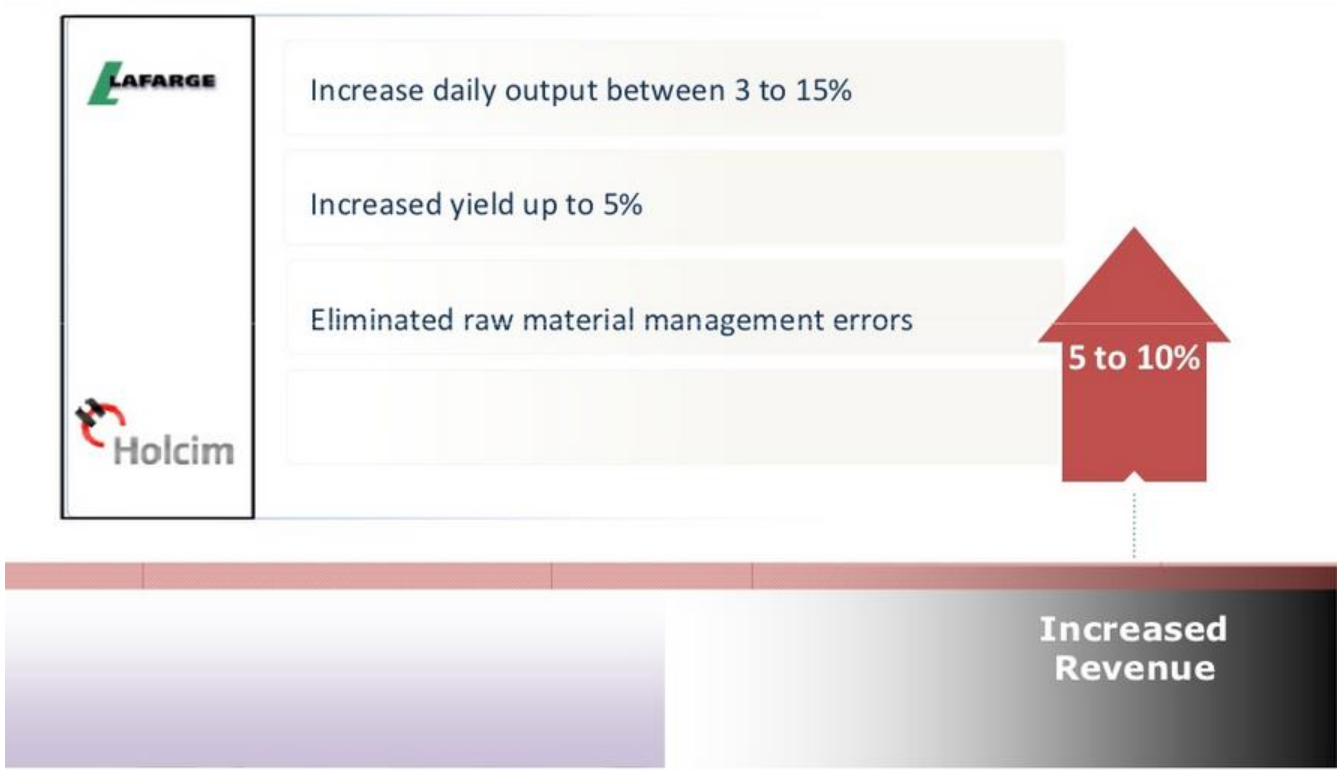
- Shorter start up phase 5 to 20% faster
- Off Quality product improved by 30%
- Product variability was reduced 20%
- Increased first pass quality
- Dramatically improved consistency of quality

20 to 30%



Reduced Operating Costs

PI in Cement – Key Savings



PI in Cement – Key Savings

LAFARGE

25-40% reduction in IT application development costs

Payback in one year; deployment across large number of sites.

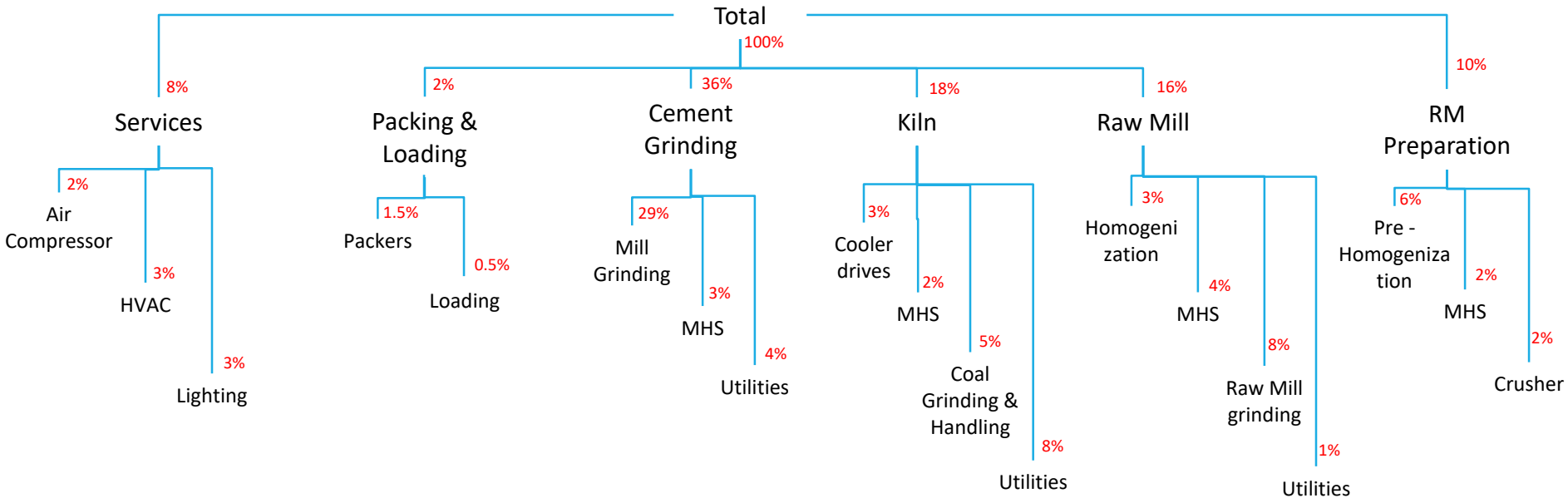
Increased product tracking accuracy to 85-90%

Holcim

20%

Reduced IT Costs

Energy Waterfall



Some Energy Efficient Practices

Your operations team is equipped with integrated and reliable source of data, ease of analysis, alerts and sharing to bring results.

SINGLE VIEW OF TRUTH

Efficient transport systems (dry process)	Separate raw material grinding (dry process)
Raw meal blending systems (dry process)	Raw meal process control (dry process)
Slurry blending and homogenization (wet process)	High-efficiency classifiers/separators
Conversion to closed circuit wash mill (wet process)	Fuel preparation: Roller mills
Advanced raw meal grinding (dry process)	
Clinker Production (Wet)	**Clinker Production (Dry)**
Energy management and process control	Energy management and process control
Kiln combustion system improvements	Kiln combustion system improvements
Mineralized clinker	Mineralized clinker
Indirect firing	Indirect firing
Oxygen enrichment	Oxygen enrichment
Mixing air technology	Mixing air technology
Seal replacement	Seal replacement
Kiln shell heat loss reduction	Kiln shell heat loss reduction
Refractories	Preheater shell heat loss reduction
Efficient kiln drives	Refractories
Conversion to modern grate cooler	Efficient kiln drives
Optimize grate coolers	Conversion to modern grate cooler
Conversion to semi-dry kiln (slurry drier)	Optimize grate coolers
Conversion to semi-wet kiln (filter press system)	Conversion to modern grate cooler
Conversion to pre-heater, pre-calciner kiln	Optimize grate coolers
	Low pressure drop cyclones for suspension pre-heaters
	Heat recovery for power generation
	Long dry kiln conversion to multi-stage pre-heater kiln
	Increase the number of preheater stages (from 5 to 6)
	Addition of pre-calciner to pre-heater kiln
	Long dry kiln conversion to multi-stage pre-heater, pre-calciner kiln
Finish Grinding	
Energy management and process control	High-pressure roller presses – finish grinding
Vertical roller mills	High efficiency classifiers
Horizontal roller mills	Improved grinding media (ball mills)
High-pressure roller presses – pre-grinding	
General Measures	
Preventative maintenance (insulation, compressed air system, maintenance)	High efficiency fans
	Efficient lighting
High efficiency motors	Efficient dust collectors
Optimization of compressed air systems	
Product & Feedstock Changes	
High Alkali cement	Use of fly ash and blast furnace slag in kiln
Blended Cements	Use of cement kiln dust in kiln
Limestone Portland cement	Use of calcareous oil shale in kiln
Reducing fineness of cement for selected uses	Lower lime saturation factor
Use of steel slag in kiln (CemStar®)	
Fuel change	
Switch from coal to oil/natural gas	Tire derived fuel
Alternative fuels (biomass and waste)	

ecubix

OSIsoft.

VCS the growth catalyst

Contents

OSIsoft PI is trusted by the world's leading companies

Over

1,000

of the world's leading **Power & Utilities** companies

95%

of the Global Fortune Top 40 **Oil & Gas** companies

400+

Pulp & Paper sites deployed worldwide

100%

of the Global Fortune Top 10 **Metals & Mining** companies

37 of **50**

of the World's Largest **Chemical & Petro-Chemical** companies

9 / 10

of the Global Fortune Top 10 **Pharma** companies

Some Existing PI Cement Customers

CEMEX (EA)

Votorantim Brazil

Italcementi (Essroc) Italy

Cal Portland USA

Lafarge (Blue Circle) France

Heidelberg Germany

UltraTech India

- Approximately 8 cement companies use PI
- Approximately 110 Cement Plants use PI
- A typical cement plant installation of PI has between 7,000 tags and 14,000 tags
- Plants typically have 4-6 different sources of data to collect
- PI Footprint:
  - North America (30)
  - Latin America (45)
  - Europe (20)
  - Asia (15)

About OSIsoft PI

Founded in **1980**

19,000+ Installations,
4,000+ Customers
in **127** Countries

World-Class **Customer Support**

Privately Held Company

Global Presence, **27** Offices Worldwide

Power & Utilities
Oil & Gas
Chemicals
Metals & Mining

Pharma, Life Sci.
Pulp & Paper
Datacenters
Critical Facilities

"Pathfinders"
Over 20% of Revenue in R&D

1,400 Employees

65% of Global 500
Process & Manufacturing

Makers of an Open Enterprise Infrastructure:
The PI System

PI follows 4 basic steps

1. Collect, Connect and Centralize

With more than 450 off-the-shelf proprietary interfaces, PI connects time-series data from a diversity of sources – devices, machines, software systems, formats, speeds, language, frequency or delivery speed to merge them to make a unified data set ready for analysis.

PI follows 4 basic steps

2. Instantly compare historical and real-time info.

Optimized for fast and efficient data delivery, you're able to uncover information that was tedious or impossible to access before. And you're empowered to investigate intermittent issues, identify bottlenecks, troubleshoot failures, compare current vs. past performance etc..

PI follows 4 basic steps

3. Bring information to life – on any device

Prioritize information. Create context. Customize content to different audiences. Consolidate and visualize operational and business data. Uncover the true cost and value of operational decisions. Develop custom reports for regulatory authorities and translate data to virtually any device - tablet, phone, laptop and view KPI/dashboards

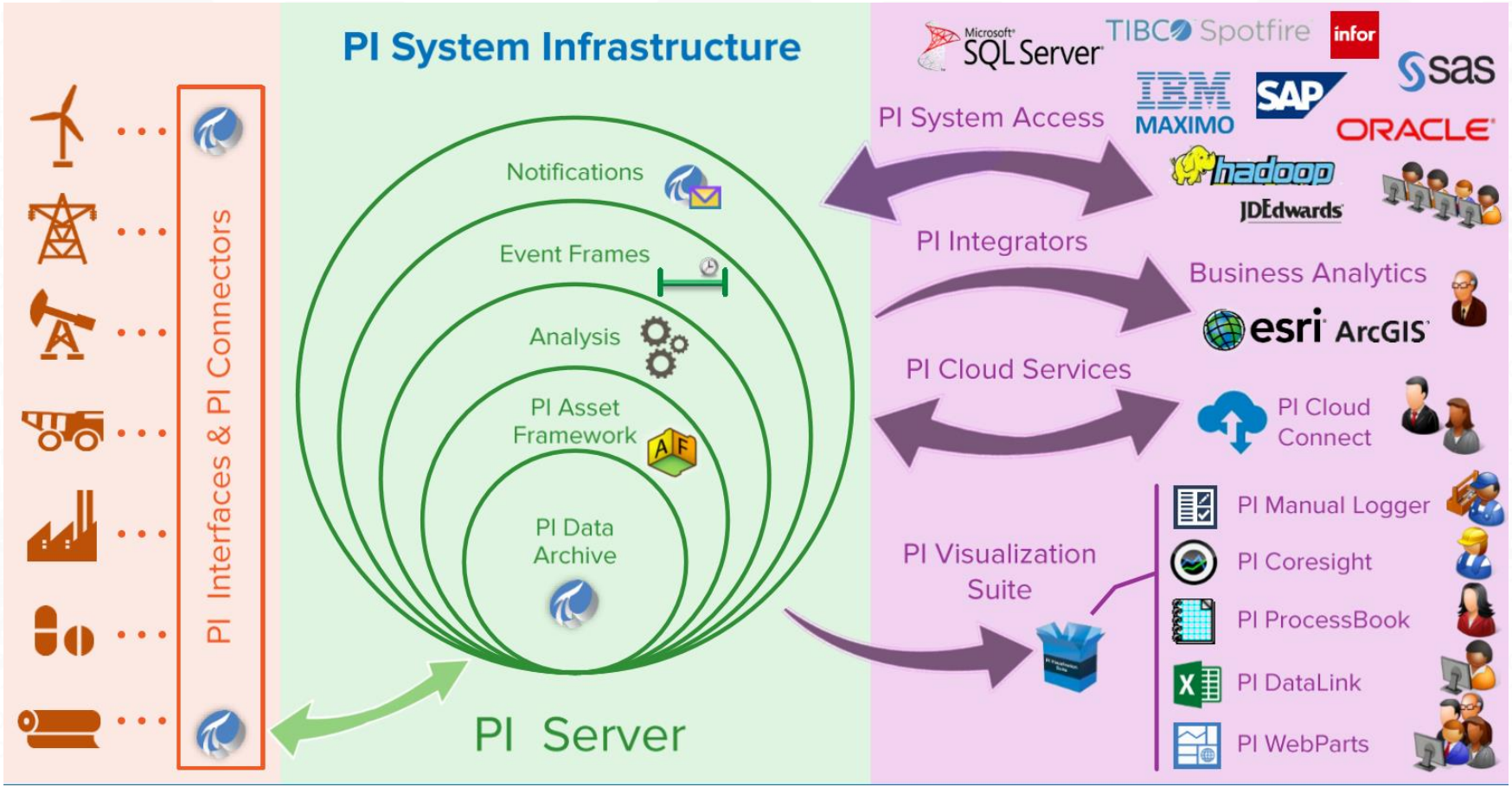
PI follows 4 basic steps

4. Foster collaboration within and across operations boundaries

Empower people - and build a more creative and innovative organization - through the strategic and targeted exchange of information.

Guide better decisions by prompting operations for optimal decisions. Measure performance. Measure Improvements

PI Product components



VCS is OSIsoft Sales and Implementation Partner

Incorporated in 2006, headquartered in Ahmedabad (Gujarat, India) having a team of 200+

VCS is a value add System Integrator.

It help organizations to improve cycle times, reduce cost and improve service levels.

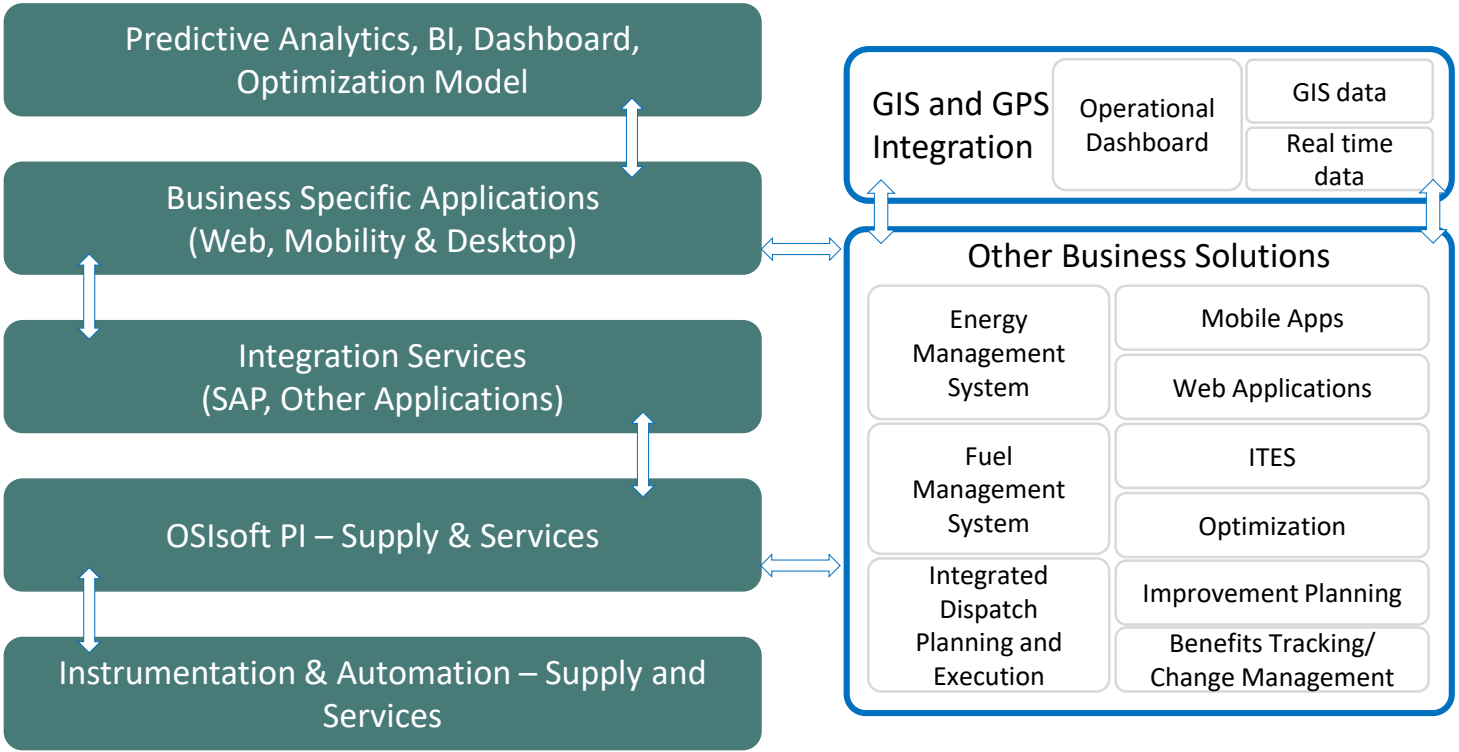
So far, VCS has identified potential worth 750 million USD and Industry has already captured benefit of 350 million USD#

Source: Post implementation client studies

About VCS : Team

- Incorporated in 2006, Headquartered in Ahmedabad, India and serving global clients
- A competent team of 200+ professionals
  - Consultants – 20+
  - Supply Chain Professionals - 5
  - Software Engineers - 100+
  - Project Management Experts – 5
  - Support/Help desk - 25+
  - Optimization Experts - 3
  - Infrastructure Engineers – 10+
  - OSIsoft Soft PI Engineers - 8
  - Admin/A/c – 15+
- Work on Onsite-offshore model. ***Consistently achieved over 97%+ Customer Satisfaction***
- Concept to Business Value realization
- Strong on ethics with four pillars of our beliefs Commitment, Openness, Respect, Enthusiasm

Solution Stack: VCS deliver projects on turn key basis

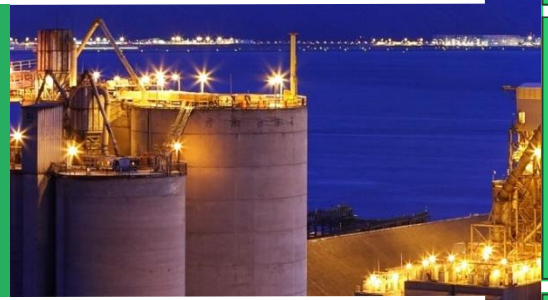


Testimonials

Among 4 chosen case studies for year 2016 in global User conference 2017.

Only one having done successful PI-Esri integration in the APAC region.

Identified among the top 20 most promising companies in India working in bulk and break-bulk supply chain area by CIO magazine 2015



Won 'Best Supply Chain Consultant of the year 2013 Award' in 7th ELSC conference – Kamikaze, ET Now, India

Valued Excerpts

"VCS have supported us over the past 5 years, with several Supply chain Management and Logistics projects across our Asian Region Group Companies, with outstanding results and highly sustainable integrity." – **Steve Vickers, Director, Holcim Vietnam**

"VCS met & went far beyond our expectations, not only from the standpoint of features & functionality, but also high levels of customized services… our tools keep getting better & more precise every year." – **S. Gadre, Business Director, BASF – South Asia**

"VCS offers a truly unique & Innovative Solutions..." – **D S Ghai, Business Head North, ACC India**

"..the approach is based on a deep study and understanding of the intricacies of the practical environment together with analytical approach…" – **M Ralapanawa, SVP, Holcim Lanka**

Some of our Valuable Clients

ecubix

APAC

BASF
The Chemical Company

India Singapore Malaysia Philippines Indonesia
Vietnam Hong Kong Sri Lanka Thailand

APAC

Holcim
LafargeHolcim

India Singapore Malaysia Indonesia Vietnam
Thailand Sri Lanka

India

Ambuja Cement
adani
GSPL GUJARAT STATE PETRONET LTD.
Eris
SHAKTIMAN MAKING AGRICULTURE MORE ECONOMICAL
POONAWALLA GROUP SERUM INSTITUTE OF INDIA LTD.
GSP Crop Science Pvt. Ltd.
CORONA Inspiring...Quality Life...
ADITYA BIRLA UltraTech
ATUL GROUP ATUL AUTO LTD.
JUBILANT ORGANOSYS
GujaratTerce Laboratories Ltd.
ACC
ZenSar TECHNOLOGIES
Panacea Biotec Innovation in support of life
Dalmia newthink!
HITACHI Inspire the Next
vivante | purefoods

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VCS the growth catalyst

Contents

Target the following benefits by adopting PI

1. Cost Containment
   - Event framing of cement type runs
   - Totalization of raw material and variable costs across type runs
   - Use of PSA to connect total costs by type up to ERP Systems.
2. Product Quality
   - Interface to lab systems to collect lab data from sample points
   - Use of AF to attach product specification tables to event framed types and kiln data
   - Use of PI Profile to view kiln temperature profile data and particle size at the finish control

Target the following benefits by adopting PI

3. Increased Asset Reliability
   - Use of AF to build an asset model
   - Use of totalizers to accumulate run times on pieces of equipment
   - Use of ACE to build repeatable calculations for equipment anomalies
   - Use of Notifications to send alerts to email or maintenance management systems

4. Energy Management
   - Use of ACE to build energy calculations
   - Use of SharePoint to build a plant wide visualization

5. Sustainability and Compliance
   - Use of ACE to build repeatable calculations
   - Use of Datalink and DLES for building environmental reports for EPA and CSI
   - Use of PI Audit Trail to satisfy compliance

6. Knowledge Retention
   - Use of Coresight for building system diagrams

Thank You

"VCS has identified potential worth of 750 million USD &
Industry has already captured benefit of 350 million USD#"