

OSIsoft®

SEMINÁRIO REGIONAL 2014

The **Power** of **Data**

L A T A M

DECISION READY IN REAL-TIME

How PI is transforming Energy Efficiency

Table of Content

1 **Business Drivers**

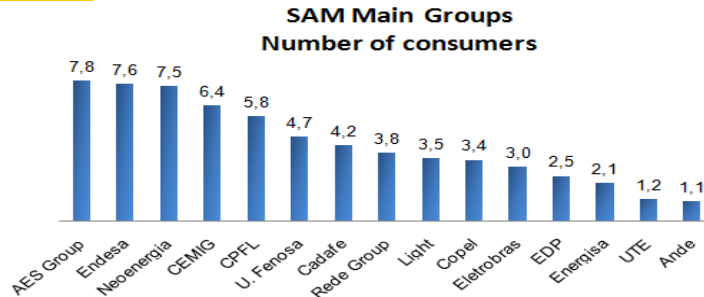
2 Strategic use of PI

LATAM Main Utilities - Groups

LAM Main Groups # consumers



37 M
Customers



LAM Hispanic MAIN UTILITIES (#Consumers)



- Owner origin: Private / Spain
- Electricity Users: 4.7 millions
- Countries: CO, PN, NY and GU



- Owner origin: Public / Venezuela
- Electricity Users: 4.2 millions
- Countries: VE



- Owner origin: Private / Spain -Italy
- Electricity Users: 3.2 millions
- Countries: PE and CO



- Owner origin: Public / Uruguay
- Electricity Users: 1.2 millions
- Countries: UY



- Owner origin: Public / Paraguay
- Electricity Users: 1.2 millions
- Countries: PY

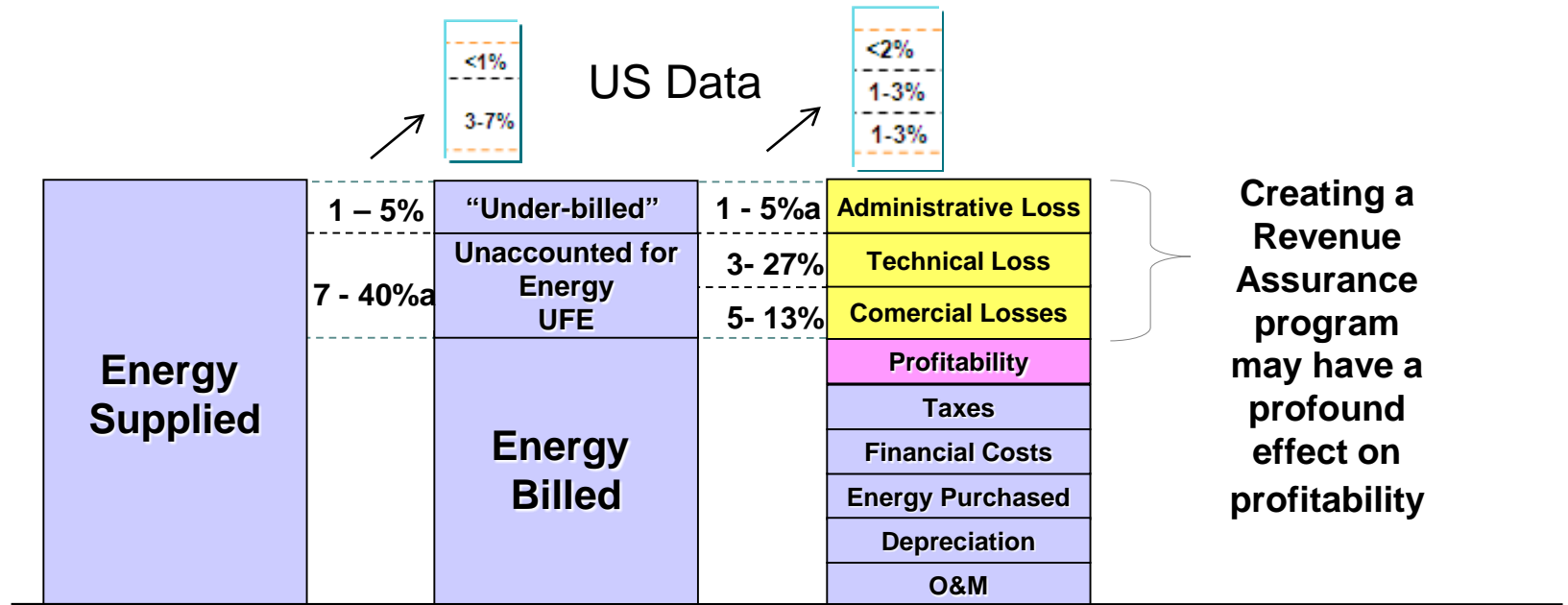
| Main Utility BRAZIL | Consumers dez/2009 | | | | |
|------------------------|--------------------|---------|-----------|-----------|------------|
| | Res. | Ind. | Com. | Rural | Total |
| CEMIG | 5.601.926 | 75.018 | 596.285 | 490.139 | 6.832.360 |
| AES ELETROPAULO | 5.583.067 | 29.984 | 356.403 | 767 | 5.987.827 |
| COELBA | 4.046.689 | 20.805 | 295.322 | 192.385 | 4.622.033 |
| LIGHT | 3.361.650 | 10.234 | 245.666 | 10.580 | 3.640.103 |
| COPEL | 2.859.749 | 66.960 | 300.138 | 352.992 | 3.628.183 |
| CPFL PAULISTA | 3.092.307 | 39.631 | 268.876 | 68.658 | 3.502.664 |
| CELPE | 2.583.635 | 13.481 | 193.674 | 174.740 | 2.994.242 |
| COELCE | 2.219.849 | 5.874 | 154.746 | 320.736 | 2.739.086 |
| AMPLA | 2.138.595 | 4.875 | 146.023 | 60.345 | 2.365.536 |
| CELESC | 1.745.915 | 73.466 | 178.463 | 219.394 | 2.237.074 |
| CELG | 1.815.954 | 10.362 | 208.905 | 159.977 | 2.213.183 |
| ELEKTRO | 1.814.085 | 21.828 | 143.138 | 122.370 | 2.123.637 |
| TOTAL | 55.515.808 | 533.484 | 4.752.023 | 3.595.508 | 65.024.136 |

Distribution problems



- Utilities focused in revenue protection, non authorized uses and collection.
- Big Utilities driving technology forced by regulation.

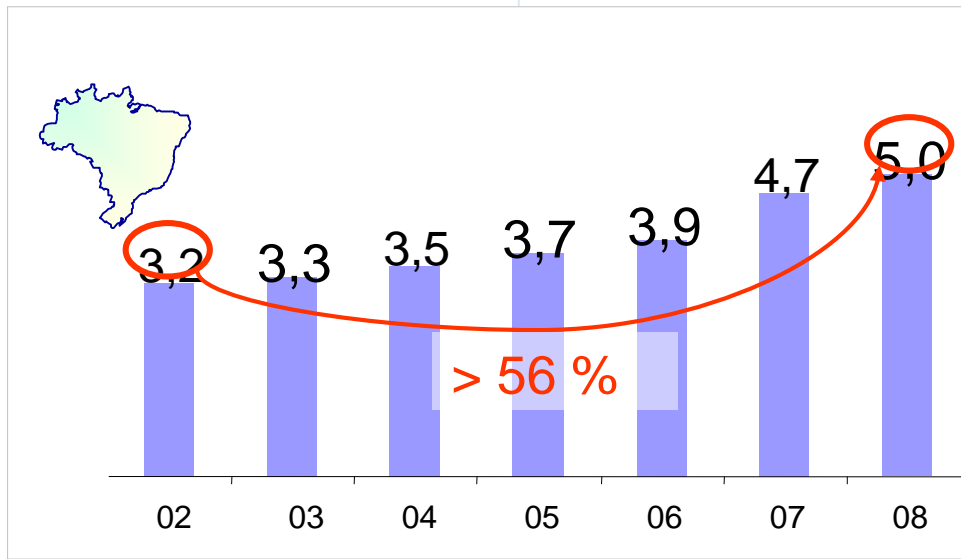
Defining Revenue Assurance



- Administrative losses: uncollected debt, data base problems, meter configuration
- Commercial losses: theft from known accounts, unmetered accounts
- Technical losses: Line losses, unbalance, maintenance problems

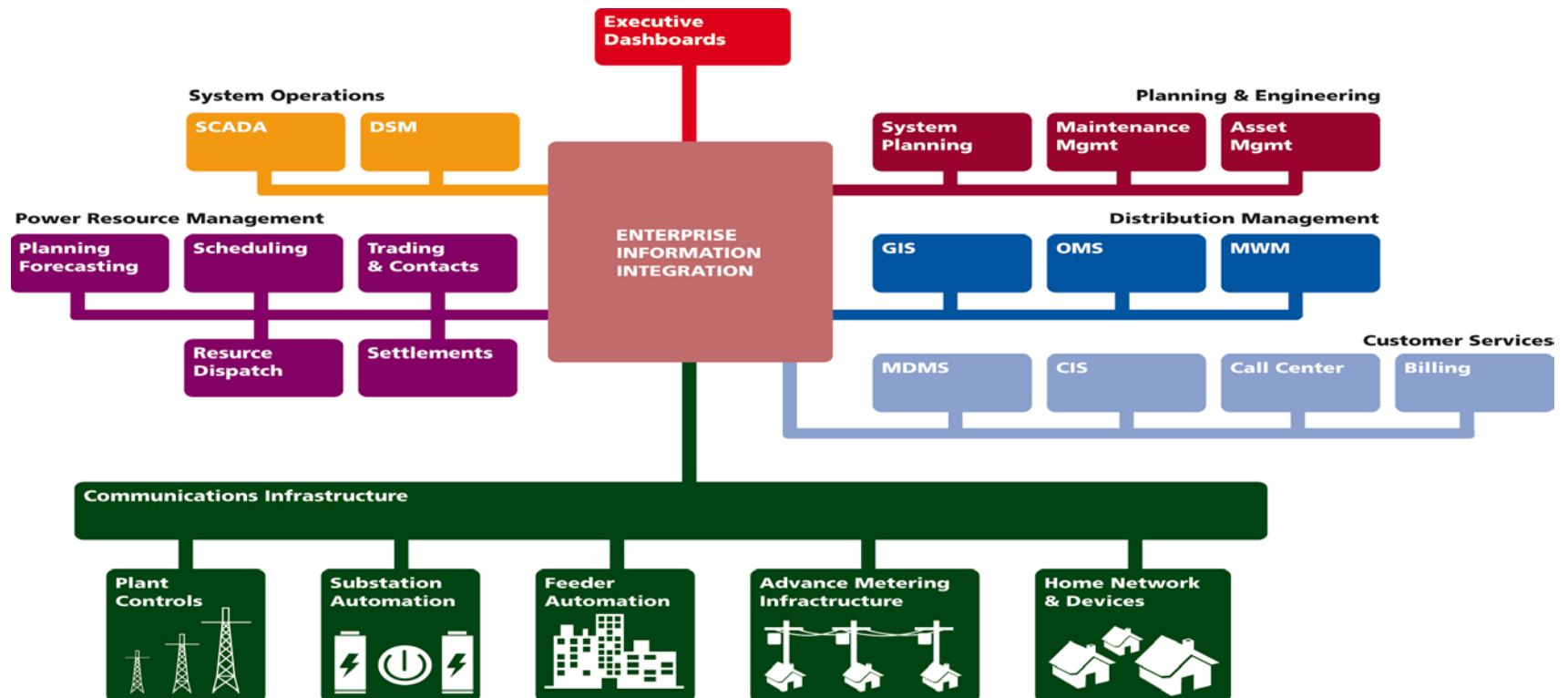
Commercial Losses Dimension

Commercial Losses BRASIL %

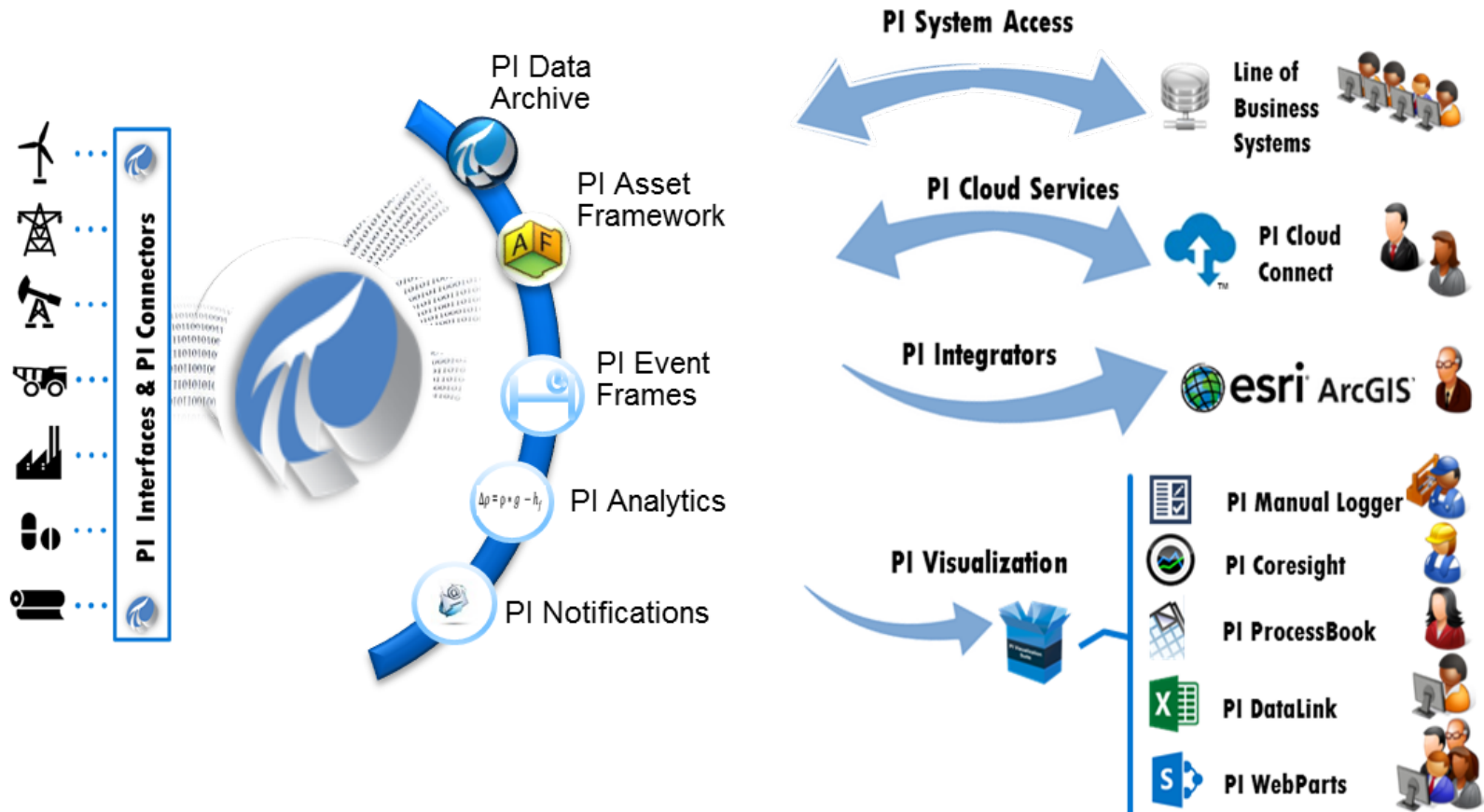


Commercial Losses Evolution

Energy & Utilities IT Architecture



Key Elements of the PI System – A Data Infrastructure



Differentiating the PI System

Aggregation

Normalization

Contextualization

Analysis

Visualization

Propagation

ISA S95

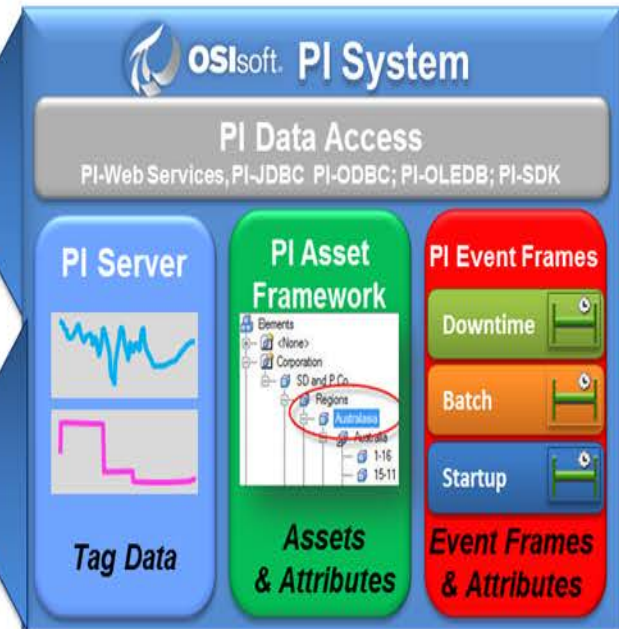
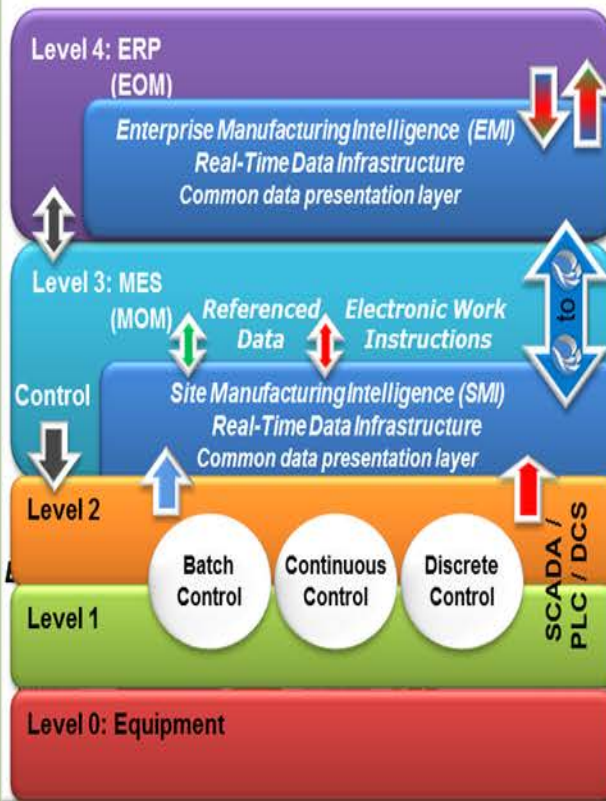


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1 Business Drivers

2 Strategic Use of PI

How Pipeline Customers Use PI Data

Supervisory Data

Operations
Visibility

Operations
Reporting

Equipment
and System
Performance

Regulatory
Compliance

Value Chain
Visibility

Data
Integration



Equipment Data & Diagnostics

Performance
Monitoring

Fleet
Efficiency

Fleet
Reliability

Fleet
Operability

Emissions
Compliance

System
Efficiency



Savings

Energy Reduction

Maintenance
Cost
Reduction

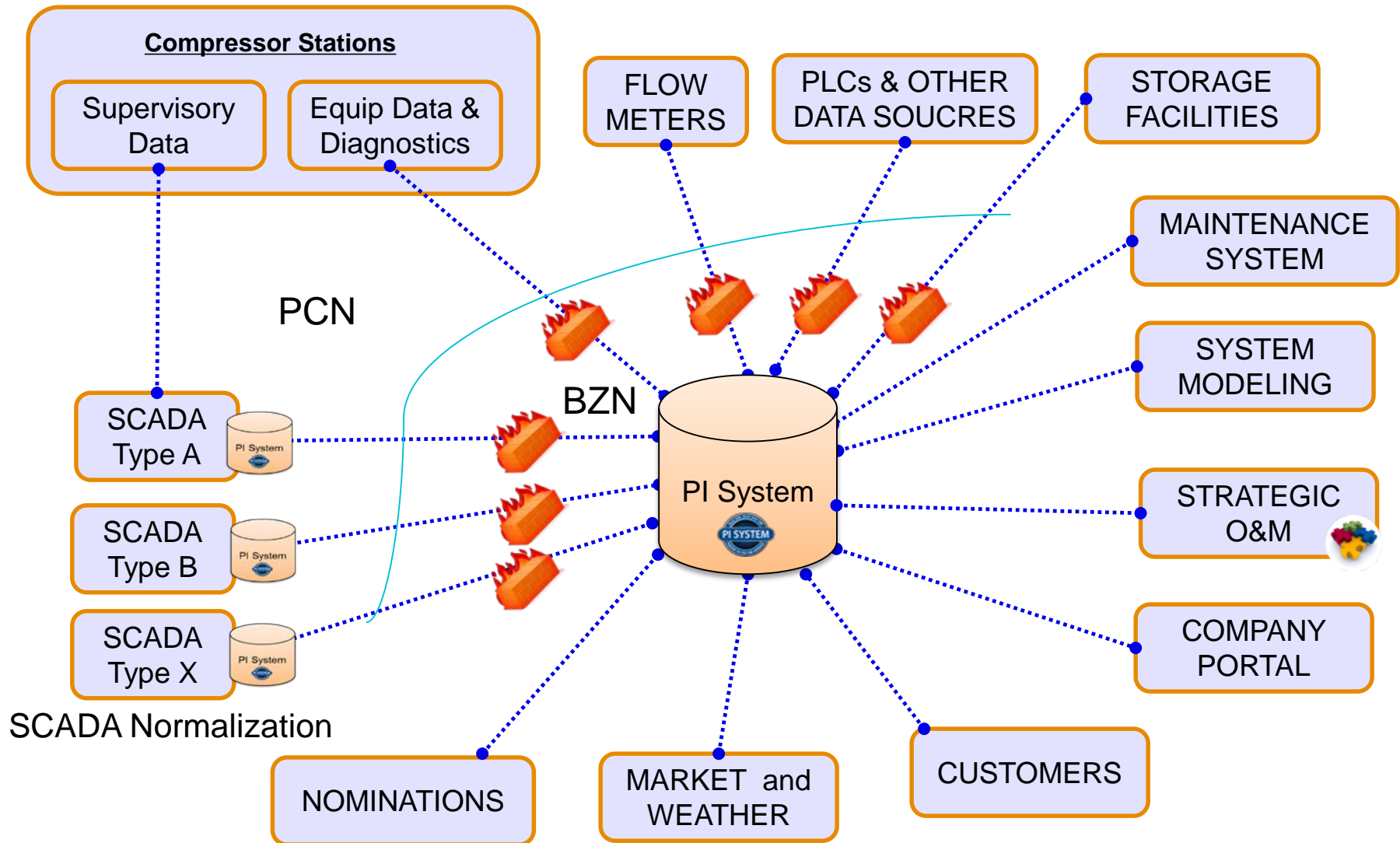
Reduction in
Automation
& IT Costs

Reduction in
Compliance
Reporting

Reduced
Inventory &
Product
Loss

Increased
Pipeline
System
Capacity

Getting Data to the Enterprise



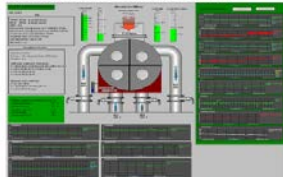
Process Optimization



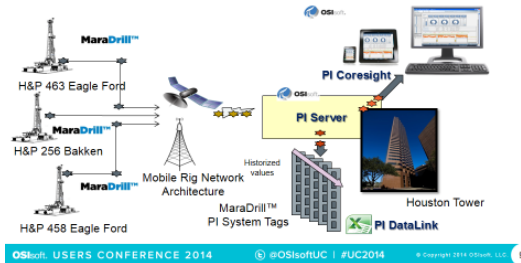
Performance Monitoring Center Hampton NH



Condenser Performance Display



Data Workflow



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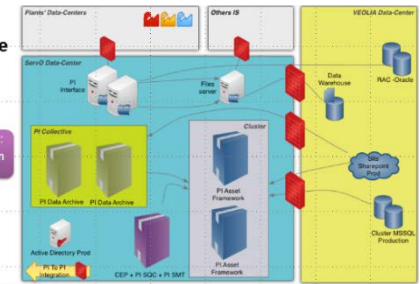


IT Infrastructure

Today:
400,000
Tags

In study:
12 Million
Tags

Simple
&
Effective



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Results and Benefits

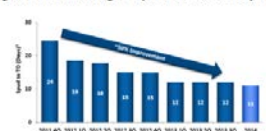
- Cooling Tower Performance Improvement - \$450K/Year
- River Water Temperature Management - \$300K/Summer
- Chemical Consumption Reduction - \$70K/Year/Plant

Continuous Improvement in Rate of Penetration (ROP)



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Eagle Ford Drilling – Spud to Total Depth



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PI System and Real Time Data Analysis

A new generation of tools, agnostic technology, for an automatic and efficient detection

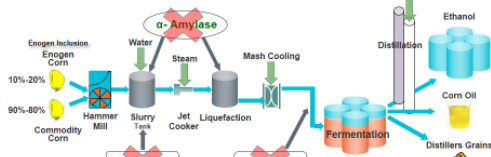
- Leak Detection on demand
- Analyze every sensor in Real Time
- Put Data for analysis in SQC and Solab
- compute proximities between the signals to determine the best location of leaks



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Enogen Impact – Dry Grind Ethanol



PI System provides the ability to monitor, analyze, measure and visualize the Enogen impact.

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PG&E Gas Operation Center

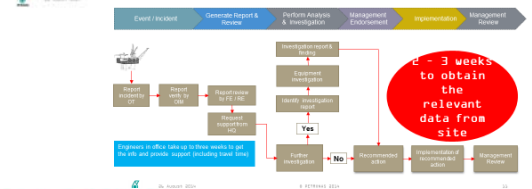


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Why do we need PI System?

- Diverse operational facilities
- Infomogeneous sources of operational data
- Real-time process data locked within isolated control systems
- Technical performance & business intelligence reliant on offline data

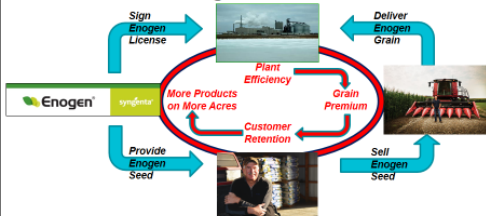
Previous information flow took weeks to obtain data



PI System deployment status

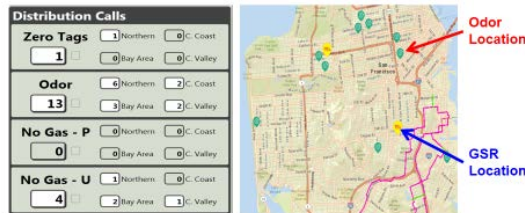


The Enogen Value Chain



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Customer Calls Displayed using Esri



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Process
Optimization

Quality
Improvement



Business Challenges

- Manual data collection despite the existing automation system.
- Data is being organized using Microsoft Excel.
- Engineers spend long time organizing data and they don't have enough time to analyze it.
- Data is transmitted via email.



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Solution

Implement PI System to manage, secure and display operational information through reports and KPIs of wells and CPF (Central Production Facilities)

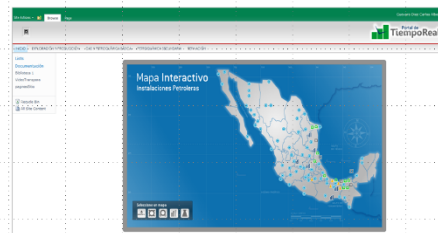


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Standardized Real Time Portal at PEMEX

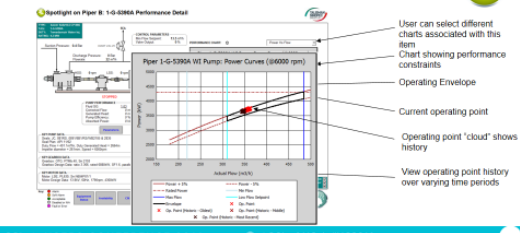
All 4 PEMEX Companies' Metrics are in a single Portal



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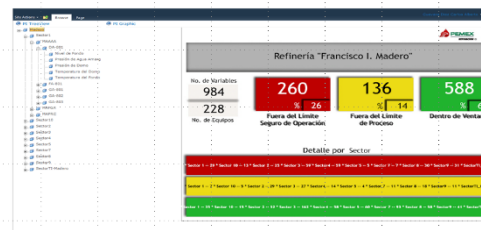


Spotlight Display - Performance



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A single detailed view for all equipment



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Examples of Value Delivered

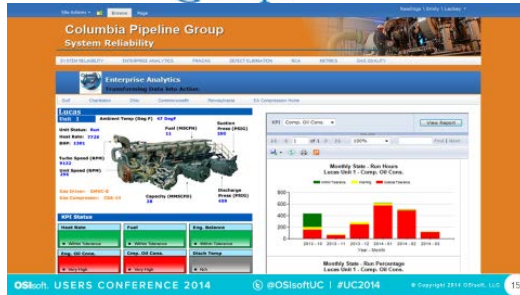
- High Seal Gas filter DP Catch**
 - DP reached 3.5BarG, limit should be 1BarG
 - Spotlight alerted users, who followed up with operators to swap to standby filter and raised work order to replace fouled filter
 - If allowed to continue could have caused 14 days lost production @11,000bbls/day : 154,000bbls
- High Seal Oil Tank Temperature Catch**
 - Temp should be around 60°C, but had reached 116°C
 - Spotlight alerted onshore users, who followed up with offshore team and it was picked up that 2 seal oil pumps were running instead of 1
 - If high temperatures had continued seals could have failed and caused 10 days lost production @7,000bbls/day : 70,000bbls
- Surging Compressor Proactive Resolution**
 - Operators reported compressor surging
 - Spotlight's history functions allowed engineers to confirm problems had occurred and make control tuning suggestions
 - If allowed to continue would have caused production/mechanical problems

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Process
Optimization

Quality
Improvement

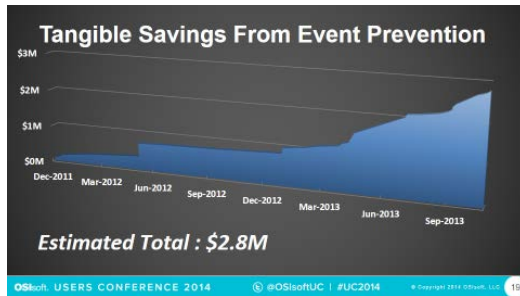
Asset Health
and Uptime



Failure Analysis and Data



View of control room video walls



Fleet Risk, Financial, Health



Return on Investment

- Based on actuary data, failure reports and FMEA effectivity we expect:
 - 250% ROI for the cost the installed system per year
 - Expect that for every \$10 Million spent on maintenance that, at least 25% on a rate base case study.
- OSisoft. EMEA USERS CONFERENCE 2014 Copyright 2014 OSisoft, LLC

Situational awareness in control room



Process
Optimization

Quality
Improvement

Asset Health
and Uptime

Energy
Efficiencies



PI System in AA Copper



Business Challenge: The need of **real-time information management** for Operational Excellence, Safety & Sustainability

OSisoft PI System:

- Single platform to **integrate all data** from the Operations Value Chain.
- Enabling infrastructure to develop **value applications** in real-time.

Real-time Operations Management

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EA Journey – From Real Time to Future Time

- Every PC in the Mill has PI ProcessBook
- Every PC with Excel has PI DataLink
- Master PI Processbook
 - used Mill wide
 - over 1000 PB displays
- Majority of PB displays
 - developed by area process and operation experts



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PI System in AA Copper

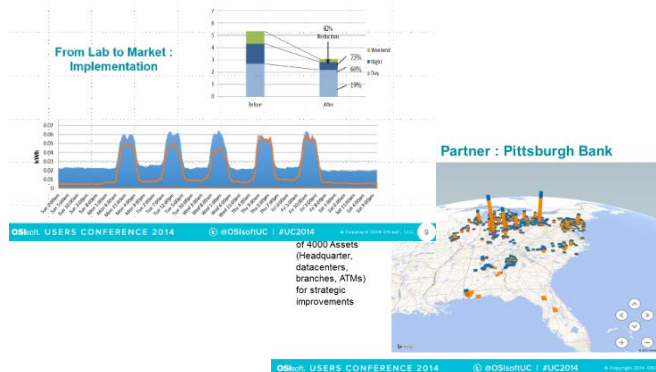
2013 results:
 >Operating profit: US\$ 1,739 millions (26%)
 >EBITDA: US\$ 2,402 millions, ROCE: 25%
 >Production Cu fine: 775 [kton]
 >Average number of Employees: 4,200

Economic Benefits (as Project estimation):

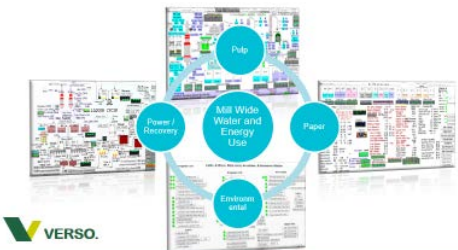
- Increase in the availability of processes and equipments: **0.2%**
- Increase in Energy Efficiency: **1%**
- Decrease of Maintenance Costs: **1%**



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EA Journey – From Real Time to Future Time



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Process
Optimization

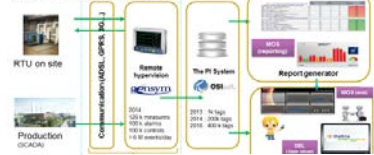
Quality
Improvement

Asset Health
and Uptime

Energy
Efficiencies



Architecture Overview



Building Energy Services (BES)

- Remote monitoring service
- Analyze building/operational data
- Take Action to improve energy performance
- Provide support with technicians
- Communicate value of energy savings with reports



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Reporting to our Customers



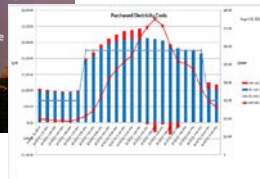
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2020 "Net-Negative" Energy Goal

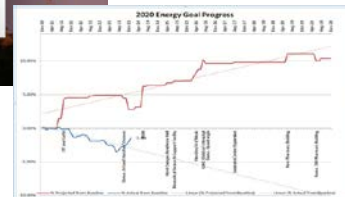
- Goal is to use no more energy in 2020 than in 2010 despite a billion dollars of new construction on campus.
- Use real-time and historical information to optimize energy supply and consumption at the University of Iowa



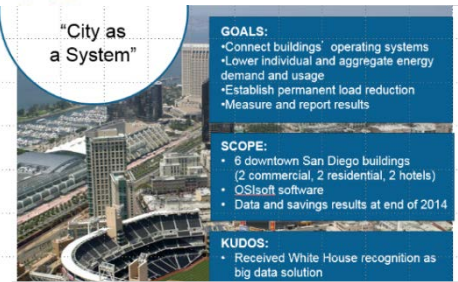
Building Energy Dashboard



- Building dashboards monitor the demand for steam, chilled water and electricity in all buildings.



"City as a System"



- GOALS:**
- Connect buildings' operating systems
 - Lower individual and aggregate energy demand and usage
 - Establish permanent load reduction
 - Measure and report results

- SCOPE:**
- 6 downtown San Diego buildings (2 commercial, 2 residential, 2 hotels)
 - OSIsoft software
 - Data and savings results at end of 2014

- KUDOS:**
- Received White House recognition as big data solution

City-wide Energy Optimization



UC San Diego's World-renowned Microgrid

- Generates 92% of campus electricity
- \$8 Million+ in annual savings
- One of the world's most advanced microgrids

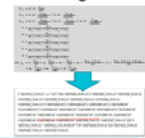


Air Emissions Calculation System

- **Process Units:**
 - Boilers/Heaters/ Furnace
 - Turbines
 - Incinerators
 - Sulfur Recovery
- **Compounds/ Pollutants:**
 - O₃
 - NO_x
 - CO
 - SO₂/H₂S
 - Greenhouse
 - CO₂
 - CH₄
 - N₂O

AECS Review – Process & Environmental Knowledge

- Reviewed/confirmed/revised/added calculation methods
- Identify all PI Tags related to air emissions calculations
- Review/confirm existing tags and tag equations
- Revise and add new tags based on environmental regulatory compliance requirements



Key Provisions in the Rules

- Requirements**
 - The CPMS must collect data at least once every 15 minutes
 - "I certify that, based on information and belief formed after reasonable inquiry, the statements and information in this compliance certification are true, accurate, and complete."
- Violations**
 - Rule violations or violations from the standards are
 - Deviations from the rules, regulations, or standards
 - Fines up to \$10,000 per day per count per facility

List of Applicable Rules

| | |
|-----------------------------------|----------------------|
| • MANDATORY Rule 1201 (Emissions) | • 40 CFR 99.1201 (a) |
| • MANDATORY Rule 1202 (Emissions) | • 40 CFR 99.1202 (a) |
| • MANDATORY Rule 1203 (Emissions) | • 40 CFR 99.1203 (a) |
| • MANDATORY Rule 1204 (Emissions) | • 40 CFR 99.1204 (a) |
| • MANDATORY Rule 1205 (Emissions) | • 40 CFR 99.1205 (a) |
| • MANDATORY Rule 1206 (Emissions) | • 40 CFR 99.1206 (a) |
| • MANDATORY Rule 1207 (Emissions) | • 40 CFR 99.1207 (a) |
| • MANDATORY Rule 1208 (Emissions) | • 40 CFR 99.1208 (a) |
| • MANDATORY Rule 1209 (Emissions) | • 40 CFR 99.1209 (a) |
| • MANDATORY Rule 1210 (Emissions) | • 40 CFR 99.1210 (a) |
| • MANDATORY Rule 1211 (Emissions) | • 40 CFR 99.1211 (a) |
| • MANDATORY Rule 1212 (Emissions) | • 40 CFR 99.1212 (a) |
| • MANDATORY Rule 1213 (Emissions) | • 40 CFR 99.1213 (a) |
| • MANDATORY Rule 1214 (Emissions) | • 40 CFR 99.1214 (a) |
| • MANDATORY Rule 1215 (Emissions) | • 40 CFR 99.1215 (a) |
| • MANDATORY Rule 1216 (Emissions) | • 40 CFR 99.1216 (a) |
| • MANDATORY Rule 1217 (Emissions) | • 40 CFR 99.1217 (a) |
| • MANDATORY Rule 1218 (Emissions) | • 40 CFR 99.1218 (a) |
| • MANDATORY Rule 1219 (Emissions) | • 40 CFR 99.1219 (a) |
| • MANDATORY Rule 1220 (Emissions) | • 40 CFR 99.1220 (a) |
| • MANDATORY Rule 1221 (Emissions) | • 40 CFR 99.1221 (a) |
| • MANDATORY Rule 1222 (Emissions) | • 40 CFR 99.1222 (a) |
| • MANDATORY Rule 1223 (Emissions) | • 40 CFR 99.1223 (a) |
| • MANDATORY Rule 1224 (Emissions) | • 40 CFR 99.1224 (a) |
| • MANDATORY Rule 1225 (Emissions) | • 40 CFR 99.1225 (a) |
| • MANDATORY Rule 1226 (Emissions) | • 40 CFR 99.1226 (a) |
| • MANDATORY Rule 1227 (Emissions) | • 40 CFR 99.1227 (a) |
| • MANDATORY Rule 1228 (Emissions) | • 40 CFR 99.1228 (a) |
| • MANDATORY Rule 1229 (Emissions) | • 40 CFR 99.1229 (a) |
| • MANDATORY Rule 1230 (Emissions) | • 40 CFR 99.1230 (a) |
| • MANDATORY Rule 1231 (Emissions) | • 40 CFR 99.1231 (a) |
| • MANDATORY Rule 1232 (Emissions) | • 40 CFR 99.1232 (a) |
| • MANDATORY Rule 1233 (Emissions) | • 40 CFR 99.1233 (a) |
| • MANDATORY Rule 1234 (Emissions) | • 40 CFR 99.1234 (a) |
| • MANDATORY Rule 1235 (Emissions) | • 40 CFR 99.1235 (a) |
| • MANDATORY Rule 1236 (Emissions) | • 40 CFR 99.1236 (a) |
| • MANDATORY Rule 1237 (Emissions) | • 40 CFR 99.1237 (a) |
| • MANDATORY Rule 1238 (Emissions) | • 40 CFR 99.1238 (a) |
| • MANDATORY Rule 1239 (Emissions) | • 40 CFR 99.1239 (a) |
| • MANDATORY Rule 1240 (Emissions) | • 40 CFR 99.1240 (a) |
| • MANDATORY Rule 1241 (Emissions) | • 40 CFR 99.1241 (a) |
| • MANDATORY Rule 1242 (Emissions) | • 40 CFR 99.1242 (a) |
| • MANDATORY Rule 1243 (Emissions) | • 40 CFR 99.1243 (a) |
| • MANDATORY Rule 1244 (Emissions) | • 40 CFR 99.1244 (a) |
| • MANDATORY Rule 1245 (Emissions) | • 40 CFR 99.1245 (a) |
| • MANDATORY Rule 1246 (Emissions) | • 40 CFR 99.1246 (a) |
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| • MANDATORY Rule 1248 (Emissions) | • 40 CFR 99.1248 (a) |
| • MANDATORY Rule 1249 (Emissions) | • 40 CFR 99.1249 (a) |
| • MANDATORY Rule 1250 (Emissions) | • 40 CFR 99.1250 (a) |
| • MANDATORY Rule 1251 (Emissions) | • 40 CFR 99.1251 (a) |
| • MANDATORY Rule 1252 (Emissions) | • 40 CFR 99.1252 (a) |
| • MANDATORY Rule 1253 (Emissions) | • 40 CFR 99.1253 (a) |
| • MANDATORY Rule 1254 (Emissions) | • 40 CFR 99.1254 (a) |
| • MANDATORY Rule 1255 (Emissions) | • 40 CFR 99.1255 (a) |
| • MANDATORY Rule 1256 (Emissions) | • 40 CFR 99.1256 (a) |
| • MANDATORY Rule 1257 (Emissions) | • 40 CFR 99.1257 (a) |
| • MANDATORY Rule 1258 (Emissions) | • 40 CFR 99.1258 (a) |
| • MANDATORY Rule 1259 (Emissions) | • 40 CFR 99.1259 (a) |
| • MANDATORY Rule 1260 (Emissions) | • 40 CFR 99.1260 (a) |
| • MANDATORY Rule 1261 (Emissions) | • 40 CFR 99.1261 (a) |
| • MANDATORY Rule 1262 (Emissions) | • 40 CFR 99.1262 (a) |
| • MANDATORY Rule 1263 (Emissions) | • 40 CFR 99.1263 (a) |
| • MANDATORY Rule 1264 (Emissions) | • 40 CFR 99.1264 (a) |
| • MANDATORY Rule 1265 (Emissions) | • 40 CFR 99.1265 (a) |
| • MANDATORY Rule 1266 (Emissions) | • 40 CFR 99.1266 (a) |
| • MANDATORY Rule 1267 (Emissions) | • 40 CFR 99.1267 (a) |
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| • MANDATORY Rule 1270 (Emissions) | • 40 CFR 99.1270 (a) |
| • MANDATORY Rule 1271 (Emissions) | • 40 CFR 99.1271 (a) |
| • MANDATORY Rule 1272 (Emissions) | • 40 CFR 99.1272 (a) |
| • MANDATORY Rule 1273 (Emissions) | • 40 CFR 99.1273 (a) |
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| • MANDATORY Rule 1279 (Emissions) | • 40 CFR 99.1279 (a) |
| • MANDATORY Rule 1280 (Emissions) | • 40 CFR 99.1280 (a) |
| • MANDATORY Rule 1281 (Emissions) | • 40 CFR 99.1281 (a) |
| • MANDATORY Rule 1282 (Emissions) | • 40 CFR 99.1282 (a) |
| • MANDATORY Rule 1283 (Emissions) | • 40 CFR 99.1283 (a) |
| • MANDATORY Rule 1284 (Emissions) | • 40 CFR 99.1284 (a) |
| • MANDATORY Rule 1285 (Emissions) | • 40 CFR 99.1285 (a) |
| • MANDATORY Rule 1286 (Emissions) | • 40 CFR 99.1286 (a) |
| • MANDATORY Rule 1287 (Emissions) | • 40 CFR 99.1287 (a) |
| • MANDATORY Rule 1288 (Emissions) | • 40 CFR 99.1288 (a) |
| • MANDATORY Rule 1289 (Emissions) | • 40 CFR 99.1289 (a) |
| • MANDATORY Rule 1290 (Emissions) | • 40 CFR 99.1290 (a) |
| • MANDATORY Rule 1291 (Emissions) | • 40 CFR 99.1291 (a) |
| • MANDATORY Rule 1292 (Emissions) | • 40 CFR 99.1292 (a) |
| • MANDATORY Rule 1293 (Emissions) | • 40 CFR 99.1293 (a) |
| • MANDATORY Rule 1294 (Emissions) | • 40 CFR 99.1294 (a) |
| • MANDATORY Rule 1295 (Emissions) | • 40 CFR 99.1295 (a) |
| • MANDATORY Rule 1296 (Emissions) | • 40 CFR 99.1296 (a) |
| • MANDATORY Rule 1297 (Emissions) | • 40 CFR 99.1297 (a) |
| • MANDATORY Rule 1298 (Emissions) | • 40 CFR 99.1298 (a) |
| • MANDATORY Rule 1299 (Emissions) | • 40 CFR 99.1299 (a) |
| • MANDATORY Rule 1300 (Emissions) | • 40 CFR 99.1300 (a) |

Daily Utility Release Report example

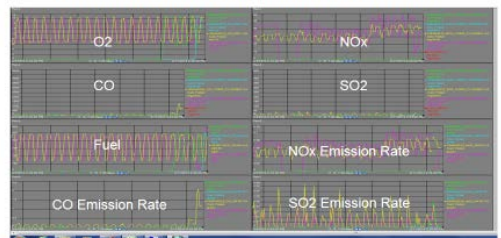


RtReport Review Screen



Compliance

PI ProcessBook Display Example A Dashboard of All Key Parameters for A Process Unit



Old MACT/NESHAPS Report

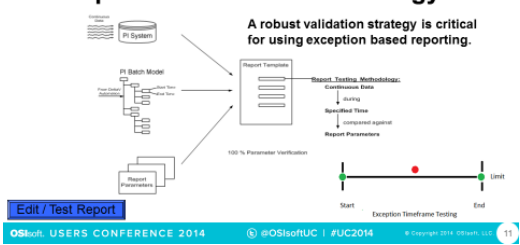
| Time | Temp | Alt/Avg | Time | Temp | Alt/Avg | Time | Temp | Alt/Avg | Time | Temp | Alt/Avg |
|------|------|---------|------|------|---------|------|------|---------|------|------|---------|
| 0:00 | 840 | 800 | 0:15 | 835 | 805 | 0:30 | 830 | 803 | 0:45 | 820 | 799 |
| 1:00 | 795 | 797 | 1:15 | 815 | 800 | 1:30 | 820 | 805 | 1:45 | 799 | 800 |
| 2:00 | 800 | 801 | 2:15 | 780 | 785 | 2:30 | 775 | 780 | 2:45 | 780 | 775 |

It would take two employees approximately 1 1/2 hours to review 6 months of records. 8 reads for each hour X 24 hours X 183 days yields over 35,000 reads per unit. One location had 2 units another had 3 units.

Benefits of using PI System

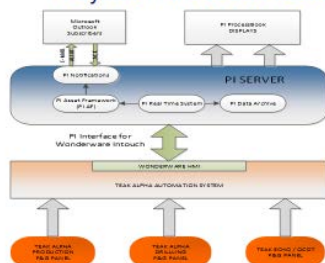
- System Reliability
- Flexible Data Handling
- Tunable Security Parameters
- Scalable

RtReport Validation Methodology





PI System Fire & Gas Dashboard Architecture



- Data from the F&G panels are sent to the Wonderware HMI via the automation network
- PI Interface for WonderWare Intouch transfers data to the PI Data Archive.
- PI Notifications (alert conditions from F&G panel) are forwarded to selected e-mail subscribers
- PI ProcessBook display dashboards allow end users to immediately determine the health of the overall system down to sensor level.

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Benefits of PI System for Fire & Gas Monitoring

- Real time monitoring of F&G system health: minimizing system downtime and maximizing availability, quality control of preventive maintenance
- Historical archiving of F&G system events: timeline of event reconstruction, identifying faults and root causes
- Better management of control for bypassing
- E-mail notification of system health issues: bypass, sensor trouble, communication failures, panel fault
- Superior process safety: assurance of safety barrier integrity
- High potential for improved safety and production with negligible capital investment

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Controlling Safety via PI System Tools



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Interlock program benefits

| | | |
|--|-----------|-----------|
| Switched off interlocks more than 1 day | 2013 (H2) | 2014 (H1) |
| Pcs | 964 | 881 |
| Days | 29,052.4 | 10,857.97 |
| Total switched off interlocks | 2013 (H2) | 2014 (H1) |
| Pcs | 2294 | 2224 |
| Days | 31,710.3 | 21,436.9 |
| Interlock relevant events (pcs.) | 111 | 22 |
| Unit shutdowns due to interlocks (pcs.)* | 11 | 0 |



*2013 /11 pcs. shutdowns = 84 lost operation hours
Calculated loss based on EDC is 1,000,000€
 EDC: Equivalent Distillation Capacity – Solomon study

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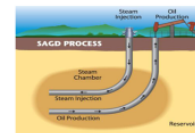
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Steam-Assisted Gravity Drainage (SAGD)



- Approximately 80% of Canada's Oil Sands too deep to mine
- Two key SAGD facilities – Firebag & MacKay River
- Parallel pairs of horizontal wells are drilled:
 - one for steam injection
 - one for oil recovery
- Safety and Operational challenges:
 - Large numbers of assets and instrumentations
 - Complex logic and criteria
 - Process Changes



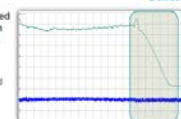
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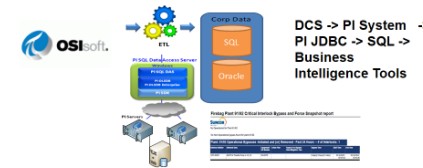
Low Flow alerts on ESPs (electric submersible pump)

- A Low Flow event was detected in one of the pumps based on wellhead temperature fall off
- Lost production
- Potentially fail of an ESP, around \$0.5 million at risk
- 130+ wells at Firebag



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Data Flow for the Bypass & Equipment Trips Monitoring



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Our Transformation Journey

Stage 1: Operations monitoring and Remote Collaboration

- PI System Data Infrastructure across Enterprise
- Asset Hierarchy including custody transfer Meter between Assets, Divisions & Companies
- Asset Framework Referential
- Real Time data collection & Dashboard



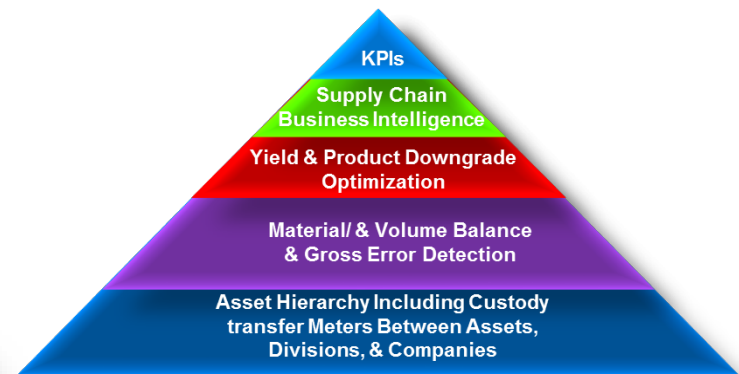
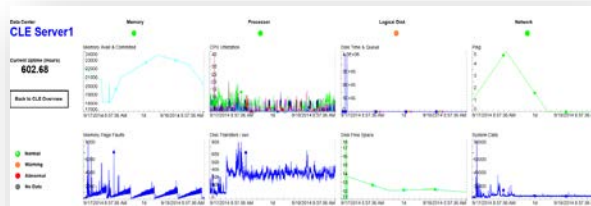
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Our Transformation Journey

Stage 1: Operations monitoring and Remote Collaboration

Stage 2: Asset Reliability and Performance Management

- Increased accessibility and ease of use added context
- Material & Volume Balance & Gross Error Detection
- Yield & Product Downgrade Optimization
- Control Room for Operations extend over Enterprise



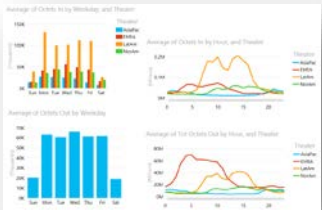
Our Transformation Journey

Stage 1: Operations monitoring and Remote Collaboration

Stage 2: Asset Reliability and Performance Management

Stage 3: Value Chain Data Optimization, Prediction

- Break down technology siloes
- Predictive Maintenance
- Supply Chain Business Intelligence
- KPI's





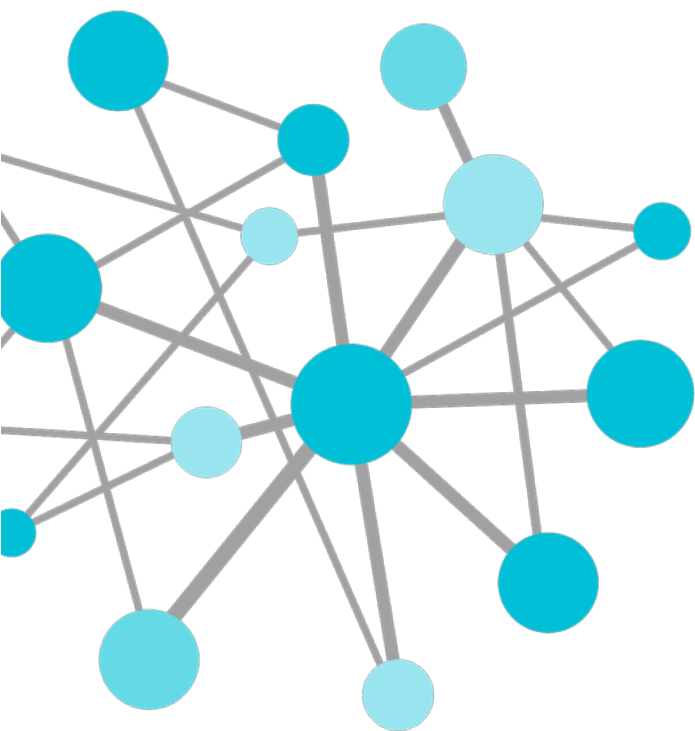
Stage 1: Operations monitoring and Remote Collaboration

Stage 2: Asset Reliability and Performance Management

Stage 3: Value Chain Data Optimization, Prediction

Operational Excellence

PI can be deployed anywhere and everywhere!



THANK
YOU

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