

OSIsoft REGIONAL S SEMINARS S The Power of Data

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How are Customers **Maximizing the** Value of their Pl Systems?

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Today's talk...

- Identify customers who are getting high value from their PI systems
- Understand how they are leveraging the PI infrastructure.
- How can your organization leverage similar opportunities?

Alyeska Pipeline



- The biggest privately funded construction project when constructed in the 1970s.
- Beginning in Prudhoe Bay on Alaska's North Slope and stretches through rugged and beautiful terrain to Valdez, the northernmost ice-free port in North America.
- Logistics & Operations centers in Valdez, Anchorage, and Fairbanks

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Alyeska pipeline

Alyeska Pipeline





- 800-mile-long Trans Alaska Pipeline
 System is one of the world's largest.
- 48" diameter pipe
- 5 Pump Stations
- 1.4 Million Barrel Per Day capacity
- Since startup in 1977, Alyeska Pipeline has transported over 16 billion barrels of oil and loaded over 19,000 tankers at the Valdez Marine Terminal.

Alyeska Pipeline



Tanana River Bridge Crossing

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Alyeska Pipeline – Challenges

- 30-years in operation
- Extreme environmental conditions
- No infrastructure roads
- If Maintenance team does not have the right parts, job does not get done.
- Large number of System Maintenance Engineers about to retire



Alyeska Pipeline – Solution

- Leverage PI to know ahead of time... to predict...
 - what the problem is
 - what parts are needed to fix the problem
 - what tools are needed for the job
- Capture knowledge of System Maintenance Engineers in models
 Alyesko pipeline



Alyeska Pipeline – Solution Evolution of Maintenance Strategies



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Alyeska Pipeline – Project Results

EDRC BENEFIT	ANNUAL SAVINGS		
Regulatory Calendar-based PM Automation			
DOT Valve Strokes – Reduced Field Man-Hours	\$400,000		
Function Testing of Valves – Reduced Field Man-Hours	\$100,000		
DOT Relief Valve Testing	\$50,000		
Tank Level PM's	\$35,000		
Continuous CBM and PBM Algorithms			
Unplanned Downtime Avoidance	\$350,000		
Device Deviation Monitoring – Reduced Field Man Hrs	\$150,000		
FIRST YEAR ANNUAL SAVINGS	\$1,085,000		

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About Nalco

- Customer base is diversified across multiple industries
 - Business is divided into two core divisions
 - Water and Process Services (WPS)
 - » Water Services
 - » Paper Services

- Energy Services (Energy)

- More than 70,000 customer locations.
- 7,000 Sales and Service Engineers.
- Supports customers in 130 countries.



Essential Expertise for Water, Energy and AirSM

Nalco provides specialty chemical treatments and services that aid in processing and protect assets so refineries can keep running longer without a shutdown

Nalco solves critical natural resource issues (water, oil & gas, air, earth products)



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Nalco's Oil & Gas Industry Challenge

- Margins for refining are slimmer than ever
- Refineries run off of design capacity
- Refiners must go years without a shutdown

Nalco's Approach







1. Understand the System

- "Best Practice" Audits
- MOC Audits
- 2. Apply "Best-In-Class" Technology
 - Chemistry
 - Control
 - Monitoring

3. Document and Communicate Value

- Data Management and Interpretation
- Turning Data into Customer Value
- Communicating Value to our Customers

Challenge: Embedded Sales Force



- Nalco's sales force works directly at the customer location
- Large amounts of manual data collected through observation and wet chemistry
- Customer also has process and operator/lab testing data
- Large number of individual systems managed by Nalco personal

Solution: Nalco + OSIsoft & Microsoft



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Nalco's Value Proposal



"This solution allows us to offer our customers high-quality performance data, and allows them and our service engineers to optimize treatment programs for maximum cost/performance and sustainability credits, as well as benchmark operations ." Steve Taylor, President

Solution: OSIsoft EA Customer



- Access to OSIsoft COE resources to aid in developing a robust and scalable architecture
- Access to any and all required interfaces and software to make the system work
- Close relationship with product managers and development resources

Manual Data Collection – PI Manual Logger

- Entering the data once while in the field reduces errors.
- Non-"cradled" solution required
- Manual Logger approval process provides consistency checks on the data
- Historical information while in the field helps to understand process variations and instantly spot deviations
- Ability to present instructions allows for faster training of techs



Information from Many Data Sources

- Information integrity, understanding the source and security are key
- Configuration on a site by site base, but consistent across the whole application
- Information roll-up for site to site comparisons and web display



Bringing all of the data together for one version of the truth

The Result: Dynamic Access to Real-Time Data



- Integration of Nalco and Customer data to provide the whole picture
- Condition-based maintenance and performance optimization
- Role-based visibility into plant operations and performance
- Summary and KPI information to customers and Nalco management
- Client-based tools to provide plant engineers with additional customized information analysis

Put the results in customers hands to bring greater value to the service Nalco provides

AEP – American Electric Power



- One of the largest U.S. electricity generators (~ 38,000 MWs) with a significant cost advantage in many of our market areas
- Largest consumer of coal in the Western
 Hemisphere
- A leading consumer of natural gas
- 39,000 miles of transmission
- 186,000 miles of distribution
- 5 million customers

Information Management Challenges

- Aging Workforce
 - Provide Smart Displays
- Improve Information Management
 - How do you manage several Million Data Points?
- How Do We Use Information to Be:
 - More Productive ?
 - Retain / Expand Knowledge and Experience ?
 - More Cost Effective ?
 - More Responsive to Market Needs
 - Process More Data with Same Staff.
 - Be Aware of Market Conditions and Current Situational Awareness

AEP – Turns to a Culture of Technology

- AEP began installing PI servers in 1993
- Five servers installed between 1993 1998
- License 40,000 Tags (1998)
- Corporate PI server installed in 1999
- Corporate EA contract in 2004



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Central Monitoring Network Backbone



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PI System Helps Control Production Costs

+								
Controllable Cost	Units	Actual	Target	Design	Deviati	on from Target (Btu/Kwh)	Cost (\$/Shift)	Total (\$/Shift
Main Steam Pressu	PSIG	1,985	2,000	2,000	-50	150	\$6.48	\$-0
Main Steam Temperatı	F	976	962	1,050	-50	150	\$-32.04	\$-2
1st RH Steam Temperati	F	976	948	1,050	-50	150	\$-59.76	\$-3
1st Reheat Attemperat	lb/hr	1,079	0	0	-50	150	\$1.86	\$0
Excess Ai	%	21.4	19.8	14.0	-50	150	\$20.86	\$-1
Exit Gas Temperatu	 F	359.4	329.7	305	-50	150	\$150.12	\$17
Steam Coil Air Heaters	klb/hr							
Condense	in. of HG	1.13	0.92	0.77	-50	150	\$64.98	\$8
HP Feedwater Heate	Btu/Kwh	5.2	0	0	-50	150	\$8.61	\$1
LP Feedwater Heaters	Btu/Kwh							
Auxiliary Powe	Mw	14.33	16.08	15.41	-50	150	\$-186.90	\$-13
Total Operator Contollable (-50	150	\$-25.79	\$6

PI System Brings Diverse Data to One Graphical View



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AEP - Results

- Use technology to enhance and expand our staff's capability and maintain headcount.
- Single point of data entry, and share that data and its context.
- It's better to have too much data than not have what you need after the fact. When in doubt, store it.
- Simplify the user's interface and experience.
- Get the data to the right person, at the right time.

Indspec Chemical Corporation

- INDSPEC Chemical Corporation (INDSPEC), a wholly owned subsidiary of Occidental Petroleum Corporation.
- One of the world's largest resorcinol producers and the only commercial resorcinol producer in the United States.
- Its Petrolia, Pennsylvania facility has a capacity of 50 million pounds per year, or half of the worldwide capacity for resorcinol.

Indspec – Operating History

- Operations are controlled using Start-of-the-art Distributed control system (DCS).
- The manufacturing process is made up of many discrete operations so a holistic view of the manufacturing process is difficult.
- Communication between operations was very limited.
- Management makes decisions based on the hand written shift reports.

Indspec – Faces new Challenges.

- Japan expands their Resorcinol manufacturing capabilities and becomes the low cost producer.
- China enters the Resorcinol market as a second low cost producer.
- New environmental regulations restrict the handling, storage and transportation of primary raw materials. (Transportation costs nearly double)

Indspec moves into Survival mode

- How do we compete in the new global market?
 - Streamline operations to ensure maximum production at the lowest possible cost.
 - Eliminate unscheduled shutdowns through the development of Predictive and Preventative maintenance programs.
 - Improve Operational awareness at all levels of the organization so process upsets can be quickly addressed.

Indspec turns to Technology

- Indspec's first PI System installed in the mid-90s
 - 3,000 Tag Server
 - 5 Interfaces
 - 35 ProcessBook and DataLink licenses

Immediate impact was seen on the Production and Maintenance Supervisor's ability to react to process upsets and equipment failures.

Indspec – Operational Awareness.

- Results:
 - Operators: Have the ability to monitor other operations to ensure they are running efficiently and at the proper operating rate.
 - Maintenance: Equipment performance data is used to drive the Predictive and Preventative Maintenance programs.
 - Supervisors: Use Process Overview screens developed using PI ProcessBook to gain a holistic view of the process.
 - Engineers: Leverage process data to make process adjustments and capital project recommendations.
 - Environmental department Leverages PI DataLink to develop their monthly and quarterly regulatory reports.

Indspec – The future....

In 2012 Indspec Chemical still faces many Competitive and Regulatory pressures BUT...

Indspec also understands that Operational Awareness through Real-time Process data is key to their existence!

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Key takeaways from these few examples....

- **Technology** Leverage Technology whenever possible.
- **Predicting the future** Data and Operational trends are a powerful tool.
- Aging work force Capture and retained process knowledge by developing Process Models and Smart graphic screens.
- **Data availability** Make the data available to all levels of your organization.

How are YOU maximizing the Value of your PI Systems?







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