Energy Information System for Kodak Park Utilizing a Large PI Server and SAP iViews

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Eastman Kodak

Kodak Park Facts

- The Largest of Eastman Kodak's Worldwide Manufacturing Sites
- Located in Rochester, New York
- Referred to as a "City Within a City"
- 1300 Acres
- 150 Buildings
- Nearly 30 Miles of Roads

Kodak Park Facts

- >20,000,000 Square Feet
- 11,000 Employees
- Operates Its Own Fire Department
- Operates Its Own Rail Road
- Operates Its Own Water and Waste Water Treatment Plants
- Operates Two Power Plants

Kodak Park, Rochester, NY

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Kodak Park Utilities

- Kodak Park Utilities Power Plants
  - 2,000,000 Pounds/Hour Steam Load
  - 125 MW Electric Load
  - 80,000 Ton Refrigeration Capacity
  - 30,000,000 Gallons/Day Process Water Load
  - 35,000 SCFM Compressed Air Load

Utility Metering

- 600 Electric Distribution Meters
- 600 Additional Distribution Meters for:

  Steam, Chilled Water, Brine, Compressed Air, Process Water, Nitrogen, Natural Gas, etc.

- Significant Metering Used within the Power Houses to Manage the Generation Side

Building Automation Systems & Distributed Control Systems

- BAS
  - Rosemount - Fix 32
  - Siemens - Apogee
  - Emerson - Delta V
  - SQL Based Historians
- DCS
  - Fisher Provox
  - Westinghouse WDPF
  - Westinghouse Ovation
  - Taylor Mod 300
  - Emerson - Delta V

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Goals of the Kodak Park Energy Information System (EIS)

- Reduce utility costs at Kodak Park through improved demand side management as well as improved optimization of our generating assets.
- Consolidation of the utilities data from many different legacy systems into a common historian and make it accessible to all employees through a web browser in real time.

Software Selection Process

- Evaluated >4 software vendors
- Software Requirements Criteria:
  - Number of points supported > 100,000
  - Interfaces to most / all of our legacy systems
  - Presence in utilities market
  - Web portal support
  - Consistent with Kodak information architecture

Project Implementation Strategy

- Eastman Kodak Company
  - Project management and architecture
  - iViews design and development
  - Network modifications
- OSIsoft
  - Training and technical support
- Exele Information Systems, Inc.
  - Interface implementation
  - Data conversion
  - Training and technical support

Solution – Logical Architecture

Access/Visibility to selected reporting

Enterprise Management

Integration Services

Distributed Control Systems

Building Automation Systems

External Factors: Weather, Market Pricing

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Solution – As Installed

SAP Portal / OSIsoft iViews

OSIsoft ProcessBook and DataLink

OSIsoft PI and RtBaseline Servers

Distributed Control Systems

Building Automation Systems

External Factors: Weather, Market Pricing

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Solution - Architecture

- PI Server – 4 CPU 4GB ram 14x140GB
- 250,000 Tag PI Server license
- PI RtBaseline Server – 2 CPU 4GB ram
- Utilized existing SAP EP environment
  - Multiple webheads and portal servers
  - Big IP load balancing
  - 15,000 + users for SAP HR functions
  - Still growing

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Solution - Infrastructure

- Utilized existing and 2 new machines for interfaces
- Some private DCS needed to be attached to corporate network
- Firewall / Network Address Translation work
- Required SSL security for SAP Portal

Solution – Current status

- Over 100,000 PI Points currently established
- 23 ProcessBook / DataLink Users
- 150 Concurrent Web Users
- 100 + iView Pages
- 18 Interfaces installed

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Solution – SAP iViews

- SVG Graphics developed in ProcessBook
- Extensive use of RtGraphic iView
- Buttons link to external web documents
  - Excel “Scorecards”
  - Adobe PDF “Energy Times” Newsletter
- All pages include RtTimeRange iView
- Adhoc trend page contains RtTrend, RtTimeRange, and RtTimeSeries iViews for custom, on the spot display

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KODAK *Workforce Portal*

Welcome JAMES BREEZE

Welcome | myHR | KP Energy

Utilities Home | Utilities Generation | Building Usage | Ad-Hoc Trend

- Steam Scorecard
- Electric Scorecard
- Chilled Water Scorecard
- Kodak Water Scorecard
- Compressed Air Scorecard

Total KP Plant Steam Flow	1426 KPPH (Goal < 1350)
KPE Steam Flow to MFG & Refrigeration	497 KPPH (Goal < 400)
KPW,X&M Steam Flow to MFG & Refrigeration	377 KPPH
KPS Steam Flow	79 KPPH
Exhaust Steam to Atmosphere	127 KPPH
Total Boiler Build-Up	353 KPPH
260# Steam - Tie Line Flow from B-321 to B-31	57 KPPH
Total Megawatts	98 Megawatts (Goal < 95)
Purchased Power	14.0 MWATTS

Link to "The Energy Times"

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Detailed Navigation

- **Steam Elec Overview**
- Steam and Electric
  - Steam Elec Overview
  - Steam Diagram
  - Purchased Power
- Refrigeration and Water
  - Refrig Water Overview
  - KPE Steam to Refrigeration
  - KP Chilled Water
    - KP Chilled Water Total Tons
    - KPE Chilled Water Total Tons
    - KPW Chilled Water Total Tons
    - KPM Chilled Water Total Tons
    - KPS Chilled Water Total Tons
  - 9 Degree System Tons
  - -95 System Tons
- Waste Water Treatment
  - Waste Water Flow
  - Waste Water Electric Usage
  - Hydro Generator Output

Start Time: *-14d

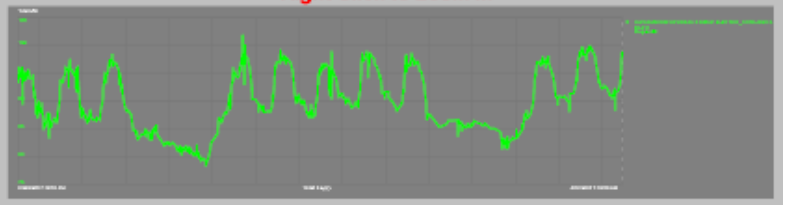
End Time: *

Apply

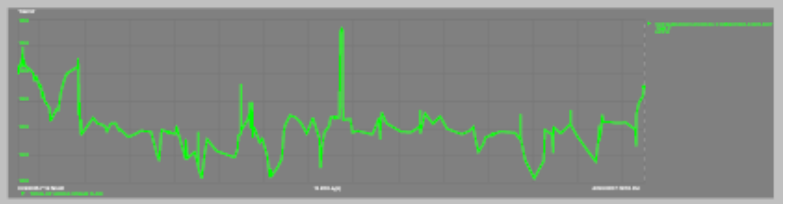
Kodak Park Power

Right Click to Zoom In

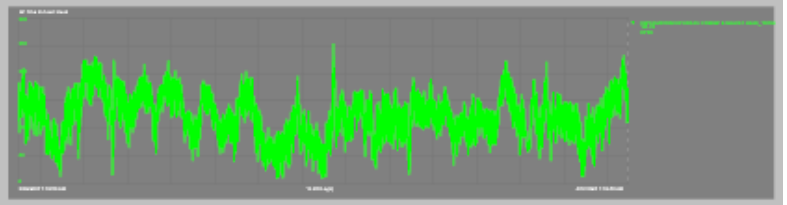
Total MW *98.4 Megawatts*



Total Steam Flow *1,426 KPPH*



Exhaust Head Steam Flow *132 KPPH*



Steam Flows KPPH

Package Boilers	Boiler 13	Boiler 14	Boiler 15	Boiler 41	Boiler 42	Boiler 43	Boiler 44
0	116.0	103.1	410.8	400.9	402.5	0.0	0.0

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Detailed Navigation

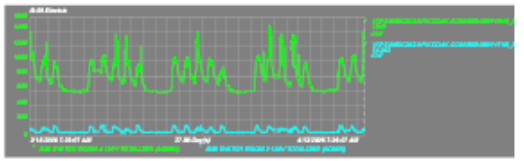
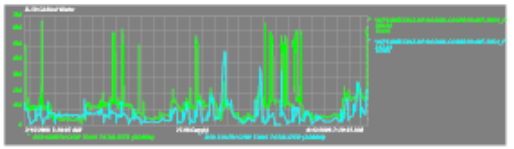
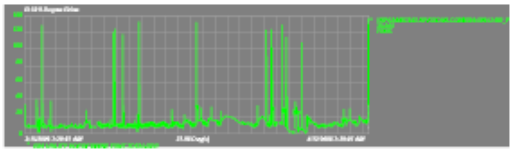
- KPE
  - B6
  - B9
  - B10&36
  - B29
  - B38
  - B42
  - B52
  - B59
    - **B59 Utility Usage Overview**
    - B59 Electric
    - B59 Chilled Water
    - B59 9 Degree Brine
    - B59 LP Steam
  - B65
  - B69
  - B81
  - B81S
  - B82
  - B83
- KPWX
- KPM
- KPS

Start Time: *-4w

End Time: *

Apply

B-59 Utility Usage

Service	Current Value		Historical Trend
Electric Load	*Switch Room #3*	*83.7 KW*	
	Switch Room #4	*1348.0 KW*	
Chilled Water Load	*North Meter*	*588.1 TONS*	
	South Meter	*220.3 TONS*	
9 Degree Brine		*35.5 TONS*	

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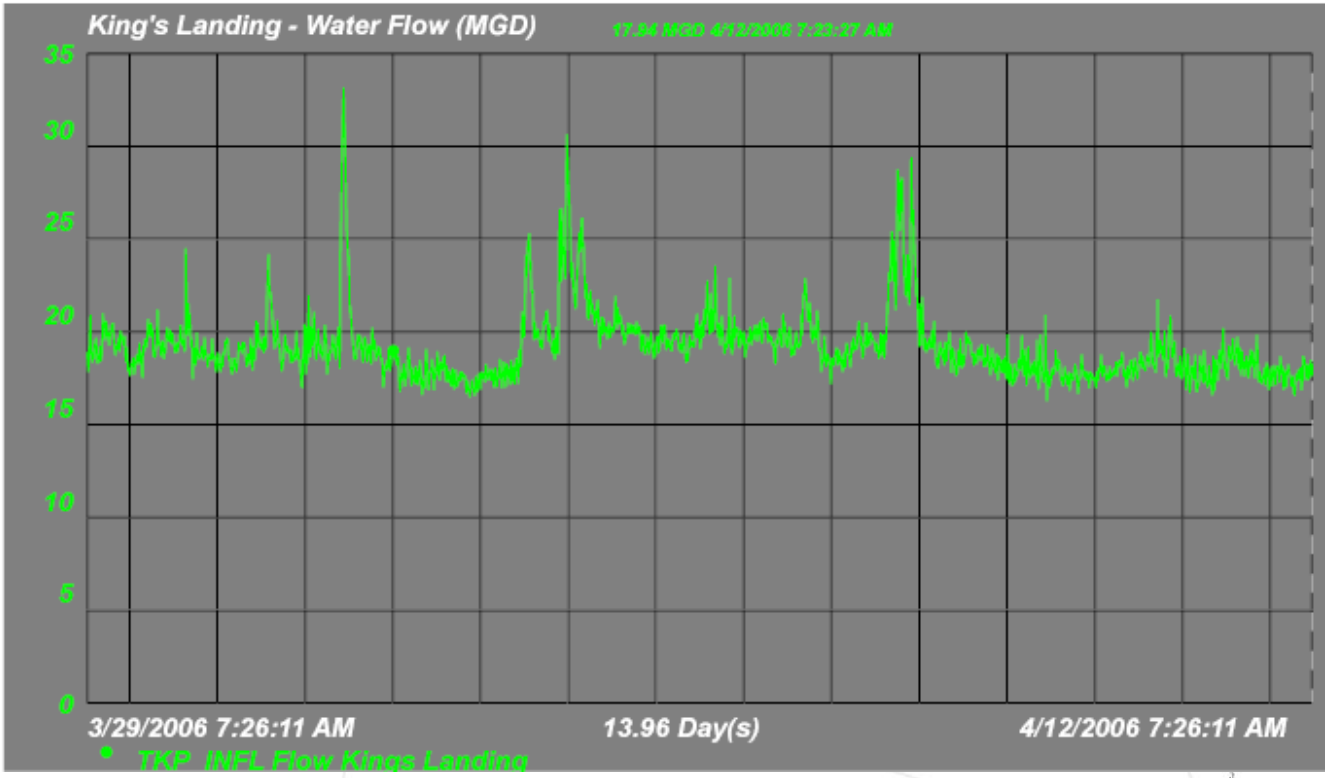
Start Time: *-2w

End Time: *

Apply



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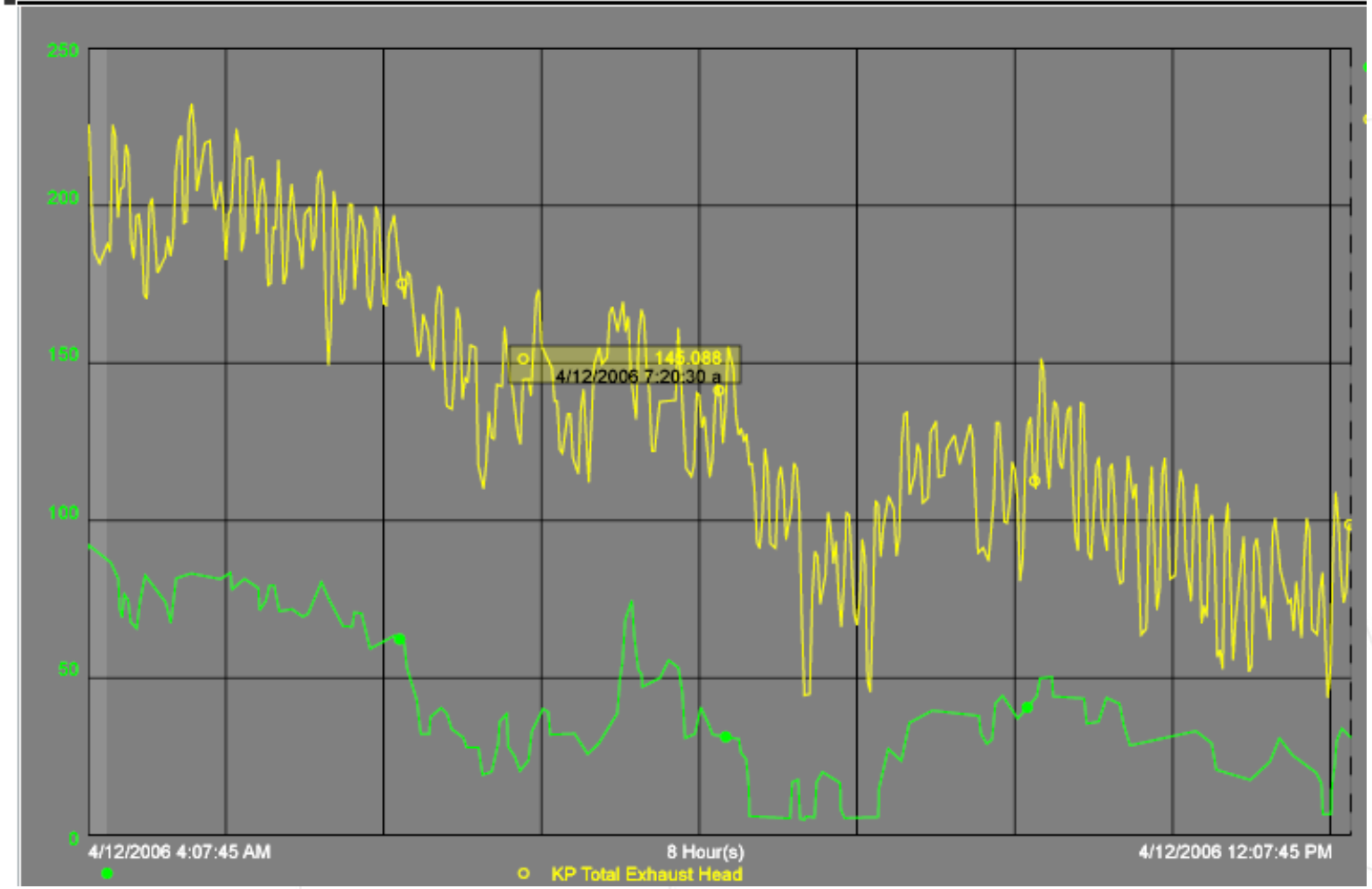
RtTrend AdHoc



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Successes

- Many demand side findings
  - More effective utilization of labs with fume hoods
  - Identified opportunities in manufacturing to implement an energy conservation mode between product runs
  - Identification of off-hours HVAC usage
  - Temperature / HVAC fan set points
  - Lighting schedules
  - System is considered an essential tool during our energy savings workshops

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Successes

- Generation side findings
  - Plant loading optimization
  - Boiler fan optimization
  - Exhaust head improvements
  - Improved deaerator utilization
  - Using trending to identify tube leakage sooner

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Future

- Continue integrating other systems and other sites
- Add distribution metering as meters are upgraded
- Use data to support all conservation efforts
- Expand upon additional analytical and graphical capabilities

Questions?

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