Conductor™
Energy Asset Management Solutions

Benefits Realized

- Improved financial performance and plant profitability
- Reduced total cost of natural gas
- Increased energy consumption awareness
- Easy and quick access to performance indicators
- Continued on-site support from NovaTech Engineers

Reducing Energy Costs with KPI Dashboards

Conductor™ Energy Asset Management Solutions integrate utility costs, peak demand penalties, and equipment efficiency to enable smart energy management

OVERVIEW

The customer—a specialty chemical manufacturer and global leader in water, hygiene, and energy technologies and services—needed a smarter way to manage energy costs for their safety and environmental award-winning facility in Garyville, Louisiana. The NovaTech Conductor™ Energy Asset Management Solutions (EAMS) designed for their facility monitors the performance of all major utility equipment, minimizes peak demand penalties, and optimizes equipment usage.

BUSINESS CHALLENGE

The customer needed an enterprise solution to manage common verifiable energy costs, and be able to access accurate, up-to-date information to ease the financial burden of utilities consumption and inefficient equipment. The customer's goals to be realized were simple:

- Reduce energy costs per unit of production
- Create a culture of energy stewardship across departments
- Improve efficiency of operations
- Gain a better understanding of energy usage as compared to production levels

NOVATECH SOLUTION

1. Establish Baseline and Key Performance Indicators (KPI)

Working closely with the customer, NovaTech engineers craft a sophisticated set of programs and calculations to track the efficiency and energy usage of critical plant equipment, and conducted a series of comprehensive Factory Acceptance Tests using simulation techniques and historical plant data. Next, a comprehensive set of Role-Based Dashboards and Trends were created to facilitate efficient visualization of KPI's associated with plant operation. These web-based displays are available to all plant personnel via the EAMS web server which resides on the plant's Intranet. Finally, detailed design documents and user manuals were created and used to conduct training for the newly installed system.

$$\eta = \frac{Q_{steam}}{Q_{gas}}$$

$$\eta = \frac{F_{steam}(c_P(T_{bp} - T_{BFW}) + \Delta H_{vap})}{F_{gas}\, Q_i}$$

where

η = boiler efficiency, a real number between 0 and 1

F_{steam} = mass flow rate of steam, $\frac{lb}{min}$

cP = specific heat of water, $\frac{BTU}{lb\,°F}$

T_{bp} = boiling temperature of water, °F

T_{BFW} = boiler feed water temperature, °F

ΔH_{vap} = latent heat of vaporization of water, $\frac{BTU}{lb}$

F_{gas} = volumetric flow of natural gas, SCFM

Q_i = net heating value of natural gas, $\frac{BTU}{SCF}$

Boiler Efficiency Calculation

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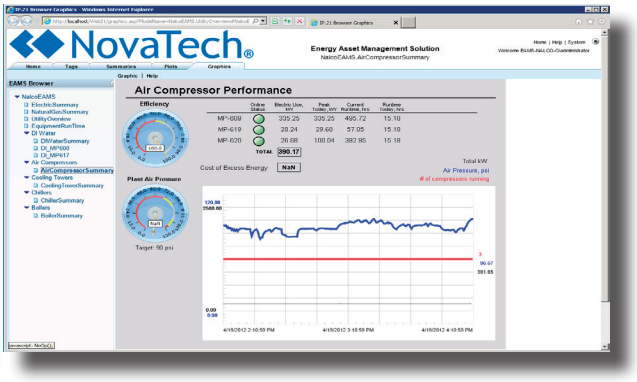
NovaTech®
Bitronics ◆ D/3 ◆ Orion

2. Develop Enterprise-Wide Dashboards

EAMS dashboards and trends are designed to deliver information quickly and accurately. Dashboards raise awareness with respect to energy usage and drive positive behavioral change. Summary screens are designed for utilities managers and detailed screens provide additional information of interest to utilities supervisors. The utility overview dashboard provides information regarding the efficiency of each utility area of the facility and contains links to detailed dashboards for each utility area. Associated trend groups provide quick access to both real-time and historical data.

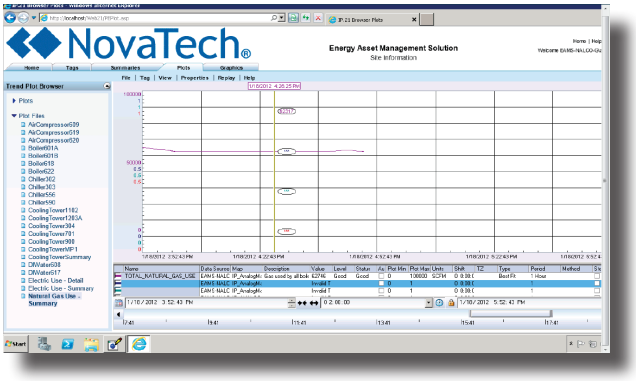
Energy Asset Management Overview Dashboard



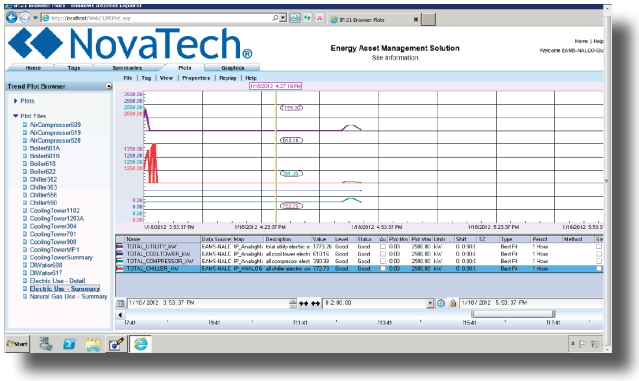
Air Compressor Performance Dashboard

3. Reduce Energy Costs

To help the customer monitor the performance of all major utility equipment at the facility, including water and glycol chillers, cooling towers, de-ionized water trains, air compressors and boilers, an advisory system is created. This new system quantifies potential savings and financial losses caused by energy consumption at peak demand rates and operating utilities inefficiently. Primary reduction in utility cost will be realized when operations are adjusted to reduce utility usage during peak demand times. The total cost of natural gas purchased will be reduced when steam is generated by the most efficient boilers and maintenance is performed on inefficient equipment. Additional savings are achieved when utilities equipment are well maintained. After several months of recording performance data, the advisory system will quantify the resulting savings from proper equipment maintenance.



Natural Gas Usage Summary



Electricity Usage Summary

MOVING FORWARD

KPI dashboards are already producing benefits and raising awareness with respect to energy consumption and plant profitability. The customer plans to implement the solution in additional facilities, and is considering the use of Advanced Process Control to automatically adjust for fluctuating energy costs. After a six-month calibration period, the results of the current solution will be compared with previous performance to provide a cost-justification for future work, and to incorporate utilities that are not directly purchased by the organization, including: de-ionized water, chilled water, cooling water, steam, and compressed air. Now, managers and supervisors are able to make better decisions about purchasing utilities, reducing utility demands and generating utilities more efficiently.

For more information about the Conductor™ Energy Asset Management Solutions (EAMS), and how NovaTech can help you implement an energy management solution, contact NovaTech at 800.253.3842 or visit us at www.novatechweb.com/process/conductor-eams.