

Saving on Utility cost in Production and reduce wastages Using ULTIMA Utility Management System

Abstract

To have an competitive advantage, client who is into speciality chemical industry wanted to have visibility of the utility life cycle in the production lines. They used to collect manual data from field devices or operational systems which was a tedious process. This has resulted in issues due to data inaccuracy and often resulted in wrong decisions. The major goals for implementing ULTIMA included

- To have the entire utility data of different plants accurately on a real-time basis
- To have specific utility cost for a particular product
- To have analysis about the utility life cycle in production lines
- To identify and reduce wastage in utility lines

Business Challenges

- Convergence of Operational Technologies such as PLC's, SCADA, DCS and field meters to have a comprehensive view and analytics of multiple utilities and plants on a real time basis
- No visibility to top management on the utility accounting - utility wise and plant wise consumption & production cost
- Need for integrating the production data from ERP to accurately compute specific-energy-consumption (SEC)
- Energy meters or Flow meters installed in remote locations and manual log book seemed too absurd
- Meter data were collated in a spreadsheet called for concerns on the integrity of data collected
- Not able to evaluate or allocate energy related costs to various sections or lines

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Case Study

Industry

Chemical

Offerings

Consulting Services and ULTIMA - Utility Management System

About The Client

Merchem Limited is one of India's leading manufacturers of chemicals and auxiliaries for the rubber industry. The company's product range include accelerators, antioxidants, rubber processing aids, agrochemicals, water treatment chemicals and specialty chemicals.

- Limited capability to analyse Utility consumption patterns/trends - by plant, section, shift or product or for a time period
- Not able to identify points of high-consumption or waste
- The anomalies in the utilities could not be traced or alerted on a real time basis

Solution

- Utility Meters covering all the major sections and subsections are linked through data-concentrators and all the data are fetched in Client PC installed in Merchem Plants
- Data is monitored at 5 seconds interval for exceptions and logged at 15 minute interval for analysis
- ULTIMA desktop and Web Clients can now access real time as well as historical information on utility parameters from anywhere at Plant / Corporate Level.

Results

- Management has accurate information regarding utility usage of every plant-section over any period of time. This has led to better load management and equipment scheduling and reduced operating expenses
- Plant personnel are alerted by system when monitored attributes exceeded the bench marked limits (variance) resulting in proactive response and reduced downtime
- Costs incurred from utilities are appropriately allocated to various departments paving the way for improved audit and accountability
- Analysis reports helped to understand daily, weekly, monthly and yearly power consumption norms and trends and it has opened many avenues for energy savings
- Business Intelligence Insights (Dashboards & Reports) to Corporate, Plant Heads and Operations team.

About Grove Limited

Grove is a digital transformation and technology services company, providing consulting and delivering optimum solutions, including those in sustainability, mobility, big data, and cloud computing. Our deep industry expertise in utilities and business processes, leverages technology to optimize your IT into a strategic asset. Grove has invested enormous man years in the research and development of utilities and its life cycle in different industry verticals. Since utilities are the single and largest controllable cost in production, Grove has identified all the possible arenas to save the utility cost and is adding value to the global sustainable initiatives.

Cost Savings by Utility Management Solution- ULTIMA – Percentage of Utility Expenses			
Sr. No	Challenges / Aspects	Operation Wise Benefits through ULTIMA	% of Saving Approx.
1	Manual data collection errors & Analysis Efforts	Eliminated Human effort / interference in data collection	3.4
		Accuracy of the Data (Concerns on data integrity)	
		Accurate and timely analysis of power quality, voltage unbalance, current THD, voltage THD, Steam pressure, flow rate, temperature and other critical utility parameters that helped streamlining the operations and maintenance of the plant - contributed to cost saving	
		Provided cost analysis utility wise, product wise, shift wise and plant wise which reduces man efforts, hence contributing in cost saving	
		Utility MIS across multiple utilities (Electricity, Steam, Compressed Air, Water & Gas) and multiple plants (eliminating manual multiple spread sheets and reports)	
2	To reduce the furnace oil consumption	Identified the heat wastage by monitoring heat of flue gas. The flue gas temperature was reduced and maintained at 180 C from 220 C, thereby saved 10 litre Furnace Oil per hour on average	1.5
3	To reduce the energy consumption of air compressors and minimize the air leakage	It was identified that by reducing compressor operating pressure from 5.6 - 6.6 Bar range to 4.6 -5.6 Bar range, 10 % power could be saved	3.2
		Identified Air Leakages in the Compressor System using built-in evaluation systems (KPI) in ULTIMA, Reduced the Compressed air leakage through better monitoring from 12.1 % to 2.8%	
4	To reduce the energy consumption of cooling water system	Reduced energy consumption in cooling water system by monitoring the cooling requirement in plant. The Plant has 2 cooling towers with 200 TR and 100 TR capacities. Respective cooling towers were run based on the heat load, by monitoring cooling water inlet and outlet temperatures. By this, achieved 20 % power saving	0.7
5	To reduce the Power consumption	Power Factor Analysis: Helped in tracking of Power factor on daily basis and improving plant performance	5.2
		Observed high power consumption in Auxiliaries of Boiler. Reduction in speed of FD fan through VFD was employed	
		Peak Load Analysis: Track on Exact peak, off Peak & Normal Time Usage of consumption of the Utilities.	
		Voltage unbalance :By monitoring and tracking Voltage unbalance (which degrades the performance and shortens the life of motors) the system has helped in minimizing the current unbalance, torque pulsations and mechanical stress, losses, and overheating of motors thereby determined operating costs and efficiency improvements	

6	Preventive Maintenance	Proper tracking the cause helps in reducing the down time and increase the efficiency of equipments / plant	0.7
		Get exact knowledge of fault and easy track down.	
		Monitoring the replacement equipments can determine operating costs and efficiency improvements.	
7	Energy Audit preparations / Compliancy	Provides utility production & consumption data in plant equipment wise, plant wise, section wise & source wise (Hourly, Daily, Monthly & Yearly) reducing man efforts	1.2
		Contributes to cost saving by reducing man efforts and providing accurate data for analysis purposes	
		Total Savings on Utility Expenses in Percentage (approximate)	15.9

*The data has been prepared based on the Ultima analytics and indirect saving opportunities
Reference: Mr. Biju Thomas, Plant Head, Merchem Limited.

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