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POWER GENERATION SOLUTIONS

Power on

Power generation: putting energy
into business success

**Rockwell
Automation**

 Allen-Bradley • Rockwell Software

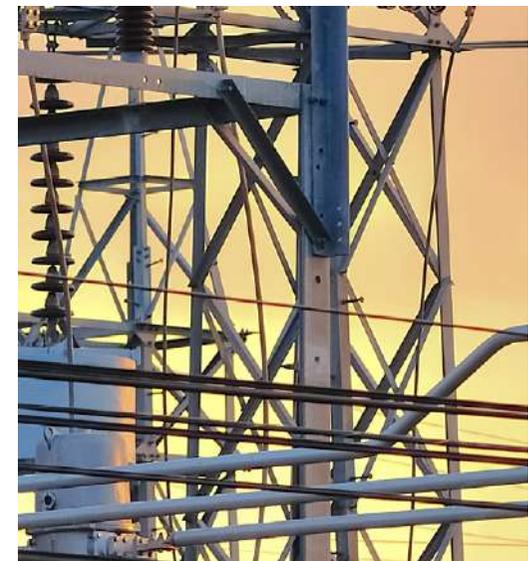
In a changing world, how do you power **on**?

The US energy sector is being redefined by the refueling of coal fired plants to natural gas and oil. Energy consumption continues to rise globally with the expansion of the middle class; this in turn increases the demand for industrial products and the energy needed to deliver them.

Against this backdrop, more stringent regulations and the need to fulfill PPAs (power purchase agreements), aging plants, workforce retirements, and rising costs impact plant availability, efficiency and performance. Therefore, focusing on heat rate reduction and greater power generation from existing assets is central to being competitive in this deregulated market. At the same time, migration of

obsolete systems is an investment in the future to take advantage of technological innovations. These transform power generation asset data into better knowledge, enabling companies to compete in the ISO real-time and day ahead pricing markets.

As coal and nuclear plants are retired, and use of natural gas and renewables increases, producers need to review existing equipment capabilities and assess the technologies best-suited to meet utility commitments and drive increases in revenue. This short guide helps you to take stock of the issues and find the best way forward for your business by better using modern technology.



To find out more about our power generation solutions visit:
[www.rockwellautomation.com/rockwellautomation/
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Optimizing production

How would a modern control system impact your uptime?

How can you improve decision-making in your plant?

As coal and nuclear plants are retired, and natural gas becomes the predominant fuel for generation, power producers need to balance existing assets, information and control systems with changing market conditions. Owners are looking to reduce costs of generation and make wise capital expenditures to extend plant asset lifecycles. At the same time, emerging technologies including big data and the cloud present new opportunities for a power company to optimally dispatch across their portfolio those best assets to meet ISO demand requirements.

60GW of coal-fired capacity will be retired by 2020

U.S. Energy Information Administration, Annual Energy Outlook, 2014

Operational Excellence through Integrated Plant-wide Control

Most power plants are comprised of numerous hardware and software platforms each responsible for managing different plant systems.

Best practice automation solutions point to a single, open control yet secure environment. This will accommodate multiple disciplines and provide real-time production information from the control system to enable better business decision-making. In this scenario, new levels of production efficiency, reliability and safety significantly reduce operating expenditures while simultaneously delivering enhanced levels of performance, while providing the ability to respond to market demands.



Workforce retirements will challenge 69% of organizations over the next five years

Source: Black & Veatch 2014 Strategic Directions: US Electric Industry

A comprehensive asset management strategy, with real-time access to role-based visualization, reporting and analysis mitigates risk and the potential for unplanned outages, while supporting optimal asset generation.

This is crucial when plants need to be ready to come on-line as demand dictates and avoid the penalties incurred in failing to meet PPAs.

Addressing the skills gap

Retiring staff reduce the knowledge base necessary to maintain existing plant systems. At the same time, as the need arises to invest in new technology to address changing industry conditions, there's a lack of suitably qualified candidates to fill the skills gap.

Today's automation technologies help to overcome some of these challenges, with remote start monitoring and control enabling producers to control more assets and plants with fewer people. An open controls platform with commercial off the shelf hardware and software provides easy access to get support and services enabling key staff to focus on their duties of keeping plant running.

Increasing efficiency

With deregulation and distributed generation changing the landscape for power producers, business success today depends on lowering the cost per kW generated.

The key lies in optimizing the correlations between multiple process variables which affect boiler and turbine combustion cycles so that the plant provides the highest available kWh for the lowest fuel investment. Model Predictive Control reduces process variabilities leading to faster peak to off-peak and vice versa power plant transitions, higher MW power production, and reduced off-peak plant base loading.

Maintaining uptime and availability

In a capital-intensive industry, the implications of the slightest change in production are magnified. Large, critical assets need to be able to run continually, with pumps, compressors, and associated control systems and instrumentation needing to perform at peak levels consistently to maintain desired uptime.



What's your best option for keeping critical assets running?





Reducing costs

Compliance with EPA legislation could cost the industry up to \$220 billion by 2034.

Source: Black & Veatch 2014 Strategic Directions: US Electric Industry

Growth in demand for electricity is impacting revenue models for power producers. This makes it vital that producers take every available opportunity to reduce operational costs. Whether this is maximizing the productivity of existing assets, or optimizing production with new technologies, automation is key to reducing capital and operational costs of production.

Minimizing downtime

With the resources, equipment and levels of investment, downtime costs in power generation are among the highest in any industry.

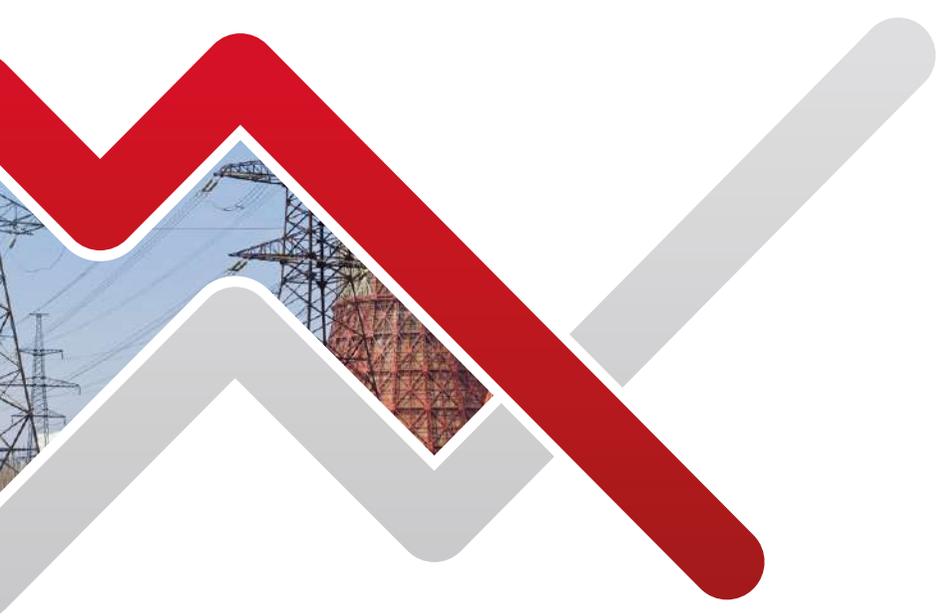
As the sector looks to capitalize on diverse fuel sources, build new capacity and upgrade infrastructure, it can implement systems and processes that improve availability, deliver optimum return on investment and reduce costs.

Reducing energy consumption

Auxiliary systems in power plants can consume up to 6 percent of electricity generated, wasted energy that could be sold, and an opportunity to reduce costs and improve plant heat rate.

Intelligent motor control solutions, will save up to 50 percent of the energy used by valves and dampers, reduce energy consumption and improve plant performance. Electricity that was previously wasted can be sold.





Aging plant systems

Legacy systems present a number of challenges, including inefficient startup performance, lack of connectivity to substation systems, lack of connectivity and liability to failure, leading to avoidable downtime and maintenance costs.

By upgrading automation systems that incorporate modern control technologies, it becomes possible to achieve higher levels of generation and reduce operational costs, increasing visibility and business decision-making at the same time.

Regulatory compliance

Legislation that looks to meet emissions targets continues to have a fundamental impact on power generation. Greenhouse gas regulations could have a significant effect on operations, and pending regulations may demand major infrastructure upgrades to achieve compliance.

Accurate real-time emissions monitoring solutions are one way of overcoming drift of flue stack sensors, and reduce the operational costs of instrument-based systems.

Legacy DCS systems typically do not have the ability to meet cybersecurity standards and regulations. Modern automation systems support compliance to NERC CIP regulations with built-in security functions for auditing, access control and security, and are future-ready in terms of changing legislation.



Summary

Optimizing production, reducing costs: putting the power in your hands.

Different industry issues will affect your business in different ways, depending on your current assets and capabilities, customer base and location among other things. You will be considering asset management strategies that improve plant heat rate and increase power generation. Upgrading legacy systems is essential to meeting the latest ISO availability requirements and achieving greater competitiveness to offer the best available power for day ahead and real-time bidding.

Integrating your infrastructure and making data more visible can make fundamental changes to operational efficiency and, ultimately, revenue.

Find out more by talking to Rockwell Automation about the industrial automation, control and information solutions available.



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For more information about our power generation solutions, please visit
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