

Eight Strategies to Drive Enterprise Profitability through Integrated Power Management and Process Automation

- Executive Summary

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Oil & Gas and Petrochemical Industry Segment

Why now is the time to rethink and reassess

There continues to be enormous pressure on energy intensive industries to reduce existing capital project costs, operating expenses, energy consumption, and to accelerate their environmental sustainability targets. Electrical power management and process automation have long been designed and operated independently throughout a plant's lifecycle. Historically this separation made sense, but IoT and digitalization have enabled a level of connectivity to manage these two domains differently in the future. Now is the perfect time to reassess and redefine the approach to capital and operational investments. By doing this, there is the potential to become more agile, stronger and to work smarter.

Profitable Efficiency and Sustainability Through Integration

To boost efficiencies and cut costs, oil, gas, and petrochemical companies have begun to consolidate their automation and electrical operations. In combination with new and enhanced digital capabilities, this approach presents an opportunity to rethink the synergies of converged operations on a grand scale, one where costs can be significantly trimmed, and productivity increased. This document summarizes "Eight Strategies to Drive Enterprise Profitability through Integrated Power Management and Process Automation," as detailed in the accompanying full white paper (see link in conclusion).

The integration of power and process is a catalyst for operational resilience and improved sustainability across the lifecycle of the plant. This integrated, digitalized approach drives Electrical, Instrumentation and Control (EI&C) CAPEX reductions up to 20% and OPEX efficiencies, including decreased downtime up to 15%, in addition to improving bottom line profitability by 3% points. End users see energy procurement cost reductions of 2-5% and carbon footprint reductions of 7 – 12% when implementing these strategies. It offers a comprehensive view of asset performance management, energy management, and the value chain from design through construction, commissioning, operations, and

maintenance. When undergoing such an integration effort, implementing the right strategies can improve operational resilience for better anticipation, prevention, recovery from, and adaptability to market dynamics and events. This plantwide data collection, reliable control & command exchange between systems, operators & control room will empower the workforce with clear and verified decision-making.

Eight value-added integration strategies

Field experience shows that the following eight strategies can help organizations achieve these power and process automation integration benefits:

1 – Unified engineering and asset information

The integration of power and process asset information should be built into asset models from the design phase and maintained through the plant's lifecycle to avoid disconnects that reduce engineering efficiency and raise OPEX. Unified engineering creates an asset digital twin of the plant that matures at every operational stage and merges engineering asset information for industrial manufacturing processes, power systems, and equipment. This allows enhanced engineering efficiency, reduced construction costs and faster project delivery timelines through automation of project documentation, thereby reducing errors and improving workflow efficiencies.

2 – System design optimization

Despite a strong interdependence, uncertainties in process electrical demand encourage power system over-design. Integrating the two aligns equipment with expected power demands, resulting in more efficient power systems that can reduce EI&C CAPEX by up to 20%. OPEX, emissions, and maintenance costs are also reduced through more efficient designs.

3 – Unified simulation

Using a digital twin asset to predict power, process, and business performance creates a behavioral model for the life of the plant. Used for engineering, commissioning, asset condition monitoring, and real-time optimization, it enables operator training, unit performance evaluations, asset operation monitoring, and real-time optimization to increase energy and process efficiency and overall business performance.

4 – Unified project execution

Siloes of design and construction tasks of the Main Automation Contractor and Main Electrical Contractor often adds expense, time and risk to projects. By creating a converged job description, like Main Automation and Electrical Partner (MAEP), better coordination and integration of systems is possible. The full MAEP process unifies project management to reduce uncertainties and mitigate risk. If properly executed, such a strategy can achieve an overall EI&C CAPEX reduction of up to 20% and scheduling improvements of up to 25% for EI&C scope.

5 – Unified Power and Process Systems

Though process and electrical systems interact, their management through separate Distributed Control System (DCS) and Electrical Management and Control System (EMCS) can limit operational visibility. Integrating the systems into one control architecture alerts operators to conditions that may compromise the electrical distribution network before a process is started and identifies how measures such as intelligent fast load shedding can impact a process. In addition to reducing costs through optimizing cabinet footprints and cabling use, operations and maintenance efficiency can be improved by understanding process and electrical system interactions.

6 – Integrated Asset Performance Management

A holistic view of major plant operating assets and their status (rotating, electrical, automation, and process equipment) is vital to improving overall facility performance. Linking root causes to seemingly disconnected events is difficult without advanced diagnostic monitoring of plant assets. An integrated asset performance management system for both power and process data provides an asset-centric view of total operations, enabling issues involving multiple equipment classes to be analyzed and resolved. Wide-ranging savings are possible through increased production uptime, extended equipment life, a streamlined procurement process and enhanced labor productivity.

7 – Process Energy Optimization and Sustainability

Energy is second only to raw materials in terms of major industrial plant expense. Therefore, understanding the interaction between process and energy usage is essential to improving financial performance. Big data analytics engines, predictive digital twins, and real-time accounting capabilities are key tools for providing effective management of energy and process interactions. Carbon footprint reductions of about 10% are typical for mid- to large-scale plants, along with a further 2% to 5% reduction of energy purchase costs through an effective contract strategy and implementation.

8 – Value Chain Optimization and Agility

Understanding current operating status, prevailing market conditions and opportunities, plus facility power and process equipment capabilities are all key factors in making the right decisions. Having easy access to such information allows plant operators to optimize feedstock selection, determine which products to make, facilitate buy versus sell options, and reveal which operating conditions maximize economic benefits while maintaining appropriate reliability and safety levels. Implementing an application architecture that supports streamlined, automated workflows, unites real time asset information, and enables enterprise visualization is vital achieving these results. This approach is key to quickly implementing the best business and operating decisions.

Conclusion

Uniting power and process management and leveraging digital capabilities reduces complexity, lowers the number of system components required for operations, and streamlines project execution while building collaboration between process and power teams. CAPEX and OPEX are improved, and digital transformation goals are achieved. This then enables dramatic improvements in business and organizational processes to flourish. To learn more, [you can access the entire white paper here](#).



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Now you can optimize engineering, operations, and maintenance performance across your entire organization, realizing efficiency and cost savings rapidly. Working together, we help you turn opportunity into business value.