



Facilities Management Solutions for Manufacturing

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Executive Summary

When most people think of facilities management they think of monitoring building systems and environmental variables. Both are typically associated with institutional or commercial facilities such as banks, office complexes, fast food restaurants, hospitals or educational institutions such as school systems or college campuses. Less obvious and less visible, but equally important, is the role facilities management plays in the manufacturing sector.

The primary relationship between manufacturing and facilities is that every manufacturing plant is a facility, and manufacturing facilities have all of the same issues that other types of facilities have, plus the additional challenge of production operations.

With the exception of pharmaceutical manufacturing, the conventional manufacturing model has always concentrated on the manufacturing process -- with environmental and facilities considerations being secondary, if considered at all. However with increased global competitiveness, manufacturers are realizing that facilities management plays a critical role in product quality and manufacturing cost. However, with this new awareness, manufacturers are realizing that accessing facilities systems and data brings its own set of opportunities and challenges.

- Monitoring and control of facilities systems can have a significant impact on operations, product quality and costs.
- In low-margin industries, the ability to manage total production costs including those associated with facilities can be the difference between profit and loss.
- Inability of manufacturing systems to access facilities data and systems leads to lost opportunities to coordinate all aspects of manufacturing.
- Proprietary vendor-specific solutions for facilities management leads to additional integration issues.
- Engineering and manufacturing staff have little or no domain knowledge of the facilities applications, leading to inability to control these variables.
- Uncontrolled and often unmonitored environmental systems introduce costs related to the manufacturing facility or the manufacturing process.
- Inability to track and analyze facilities and manufacturing data as integrated and inter-dependent variables masks problems in the overall operation.

The situation is greatly simplified if the manufacturing process and facilities management can be viewed as one environment, providing a comprehensive view of both facilities and manufacturing operations. Further, if this environment is approached with an integrated solution where the facilities management and manufacturing systems are combined, these issues become manageable.

Utility Costs

The ability to control utility cost is a major factor in modern manufacturing operations. Facilities management can have a significant impact on utility costs in areas such as electric and gas energy management and water usage.

Of these, the area where facilities management can have the greatest impact on cost is energy management. Energy costs are and will remain one of the highest production costs for every manufacturing operation. When manufacturing monitoring and control and facilities management are integrated, energy use can be monitored and controlled like any other process variable. This enables energy use to be monitored in real-time and recorded to the historian with other process data, where it can be analyzed within the context of the manufacturing process. Energy use can then be analyzed and viewed on the basis of energy costs per batch, per product, per shift and even normalized for square footage and degree day effects.

In addition, with an integrated control system, manufacturers have the potential to manage their energy cost by scheduling production, based on time-of-day rates or demand response schedules. Further, when facility and process systems are integrated, all cost savings associated with consistency, training, maintenance, operations and overhead are realized throughout the plant, site, region and enterprise.

Cost Benefits Associated with Utility Management in Facilities Management in Manufacturing

- Total operational cost is easier to manage when one integrated system monitors and controls both the process and facilities.
- Energy costs such as those for electrical power and natural gas used in the actual manufacturing process can be managed.
- Water consumption for the manufacturing process can be monitored and controlled.
- Facility energy costs for electrical power, natural gas and water can be monitored and controlled.

- Process and facility data can be integrated and analyzed for cost impact and reduction.
- Operational and maintenance costs can be reduced due to operating and maintaining one control system instead of two.

Since environmental variables can have a direct impact on manufacturing cost and quality, the benefits of managing facilities and the manufacturing process with one system and one team are greater than the sum of the benefits to each process individually.

Quality Control

In today's global economy, product quality has become a differentiator no matter what the industry. Increasingly, facilities environmental factors such as air quality, water quality and temperature are having an effect on product quality. This is especially true in the Life Science industries such as pharmaceutical manufacturing, and in the Food and Beverage industry where compliance to stringent governmental regulations is mandated. In these industries, data monitoring, collection and historization are critical to the delivery of a product that meets industry and government specifications. The ability to access an integrated process and facilities data in one system for review, analysis and reporting not only helps ensure product quality but also cost control.

Even in manufacturing processes where strict regulation isn't a factor, the ability to control the facilities as a factor of the manufacturing process can have a direct bearing on product quality.

By integrating facilities management and manufacturing systems, manufacturers can have the ability to determine if product quality can be adversely affected by environmental factors within the facility.

Quality Benefits to Manufacturing Facilities of an Integrated Control System

- Product quality is improved due to integrated monitoring and control of all related variables within the manufacturing process.
- Recordkeeping is improved due to the capture of a complete set of environmental and process variables.
- Quality is improved by a staff that is knowledgeable in a integrated control system and manufacturing process.

- Variations in product quality from facility to facility are reduced with one system controlling the facility and the process at multiple sites.
- Quality is improved through coordination of facility and process variables within the manufacturing process.
- Quality problems due to environmental variables that would not previously be considered part of the manufacturing process can be identified and corrected.

Security and Regulatory Reporting Requirements

In addition to the direct manufacturing considerations of facilities management, there are indirect implications. While not directly related to a specific manufacturing process, there are general facilities-related issues with cost implications that can be controlled and monitored by a facilities management system. These include lighting control, emissions monitoring, wastewater and hazardous waste management, as well as security. Governmental agencies at both the federal and local level are increasingly requiring not only management of waste and emissions from manufacturing operations, but reporting and data retention. Those installations failing to maintain required data storage or reporting requirements are often subject to fines or other punitive action.

An integrated process and a facilities management system make managing these issues significantly easier. Integrated process and facilities data can be extracted from the historian and included in either custom or pre-formatted reports.

By integrating facilities data with production data on a common platform, process and cost analysis can be more accurate and more realistic. When all factors associated with production are included in an analysis, the impact of facilities variables on the quality and cost of production can be ascertained and where necessary, adjusted.

Conclusion

The primary benefits of managing facilities and the manufacturing process with one system and one team increases efficiency, improves product quality and helps manage costs for the facility and the product.

The benefits of facilities management in a manufacturing environment are well documented. When facilities and manufacturing management are integrated on a common platform the benefits are apparent in every aspect of the business model.

Benefits

- Total operational cost can be controlled and reduced, and product quality improved due to integrated monitoring and control all related variables within the manufacturing process.
- Recordkeeping is improved as a result of the capture of a complete set of environmental and process variables.
- Quality is improved by a staff that is knowledgeable in a integrated control system and manufacturing process.
- Variations in product quality from facility to facility are reduced with one system controlling the facility and the process at multiple sites.
- Quality problems due to environmental variables that would not previously be considered part of the manufacturing process can be identified and corrected.
- Control of the entire manufacturing process is more effective when environmental variables such as ambient temperature, humidity, and water quality can be monitored and controlled, in addition to process variables.
- Utility costs such as those for energy and water used in the actual manufacturing process can be monitored and controlled.
- Process and facility data can be integrated and analyzed for cost impact and reduction.
- Operational and maintenance costs can be reduced due to operating and maintaining one control system instead of two.

In the late 1980s, Wonderware pioneered the use of the Microsoft® Windows® operating system in the industrial marketplace. A cornerstone of Wonderware success has been the relentless pursuit of easy-to-use software solutions that are also easy to implement and maintain.

That's why Wonderware software has over 500,000 active software licenses, helping customers manage operations in over 125,000 plants and facilities around the world. Now Wonderware has applied those same features to facilities management. With the Wonderware Industry Solutions for Facilities Management, manufacturing and process industries have the opportunity to benefit from a common platform that can provide visibility and access to both process and facilities data. The benefits are significant, having the ability to manage disparate Building Automation Systems (BAS) and the

process can have a distinct impact on two primary concerns in every manufacturing facility - cost and product quality.

Increasingly, manufacturing processes and manufacturing operations are affected by variations in environmental conditions. This can affect product quality, throughput and overall manufacturing costs. The domain knowledge in manufacturing, offered by Wonderware combined with new open standards in Building Automation Systems, results in solutions that enable more than the integration of facilities management with manufacturing. It also provides a common platform for deployment of total manufacturing facility systems to analyze manufacturing costs and quality control. It does this while delivering an integrated framework of services for world-class manufacturing facilities.



Contact Wonderware or your local Wonderware Distributor for more information on industrial automation and information solutions.

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