5 Ways Modern Integrated Automation Makes Plants Safer

By upgrading their automation technology, manufacturing plants are able to integrate safety functionality into all standard components for improved system performance and productivity. Learn five ways today's most advanced integrated automation technology helps plants exceed global safety-compliance requirements quickly and cost-effectively.

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In today’s competitive global environment, manufacturing plants are under constant pressure to contribute to their companies’ profitability and growth. In their efforts to boost productivity and efficiency, facilities are deploying integrated, intelligent safety solutions as a lever for continuous improvement and operational excellence.

Within the past decade, advancements in automation technology have made it easier for plants to reliably protect their workers, machines and the environment while improving productivity, reducing costs, and complying with stringent safety and environmental regulations. The highest-performing automation systems integrate safety functionality into all the standard components, and enable simpler, faster and more cost-effective implementation of safe and productive machines.

Many controllers — particularly older ones — lack safety-integration capabilities. But facilities must take the strategic opportunity to upgrade to modern automation technology that not only improves the overall performance of their systems, but also exceeds global safety-compliance requirements. Below are five ways that today’s most advanced integrated automation technology makes plants safer.

1. Integrated Safety Functionality
In the past, plant engineers had to hardwire e-stops, gate interlocks, light curtains and other monitoring and safety-shutdown equipment as “bolt-on” accessories to a separate safety system. With today’s most innovative automation technology, however, safety features are seamlessly integrated into all of the components. All programming — whether it’s for safety or standard hardware — is done within the same software environment while improving diagnostic capabilities and freeing up space in the control cabinet.

2. Compliance with Safety Standards
Unlike older or underperforming systems, today’s modern, high-performing automation components maximize process safety by meeting the latest international standards for fault-tolerant applications. These standards, including IEC 61508, A NSI/ISA-84, IEC 62061, EN ISO 13849-1 and IEC 61511, cover the planning, documentation and assessment of all activities required to manage safety throughout the life of a system.

In addition to making plants safer, integrated safety reduces total cost of ownership, and places less strain on engineering and maintenance personnel. It also enables greater system availability — due to improved diagnostics and troubleshooting — and greater operational flexibility, as plants can reconfigure their floor layouts and machine placements more easily.

3. Transmission of Safety-Related Data
With advancements in automation technology and the emergence of networked safety, it’s no longer necessary to run two separate fieldbuses for safety and non-safety data. Plants can use a standard fieldbus to transmit safety-relevant data, which reduces wiring complexity, system costs and training demands while improving diagnostic capabilities and freeing up space in the control cabinet.

The emergence of PROFIsafe — an integrated safety profile developed by the global consortium PROF International — extends the standard communications protocol to address special requirements necessary to conform to standards such as IEC 61508. For example, PROFIsafe adds elements such as message numbering and data-consistency checks to rule out typical network messaging faults, enabling networked safety devices to meet the reliability requirements of SIL 3 as prescribed by IEC 61508.

4. Deeper Visibility into Problems
Advanced diagnostic capabilities provide deeper, real-time visibility into system performance and behavior, enabling plants to be more proactive when addressing potential problems.

With integrated safety, it’s no longer necessary to constantly interrogate the system to determine if e-steps and other I/O safety devices are functioning properly. Today’s PLC systems conduct those validation tests automatically and report the results to the controller. Since the controller doesn’t have to initiate and send the commands across the network to conduct validation tests, the process consumes less code and less bandwidth, while making the entire system more efficient and less vulnerable to programming errors.

With safety solutions integrated directly into standard control architectures, plants can leverage automation technology to address two separate issues: functional safety and system availability. Integrated safety helps to minimize accidents and downtime by enabling operators to diagnose hazardous conditions more intelligently and quickly.

5. Remote Diagnostic Capabilities
Today, modular components such as PLCs, HMIs, drives and network switches offer integrated diagnostic functions, which makes system monitoring, troubleshooting, and maintenance easier and safer than ever before. With the integration of wireless technology, plant personnel can view the status information of all components from a networked computer or mobile device. The system can send automatic alerts to the mobile devices of responsible parties, who can securely log into the system, if necessary, to assess and correct the situation.

With real-time remote diagnostic capabilities, operators and maintenance technicians are empowered to detect, report, and correct faults quickly and safely. Technicians, for example, can troubleshoot issues inside motor-control cabinets from a safe distance, minimizing the need to wear the specialized personal protective equipment at all times that may be necessary to shield them from arc-flash hazards.

Learn more about the benefits of modern integrated automation by visiting www.usa.siemens.com/modernize.