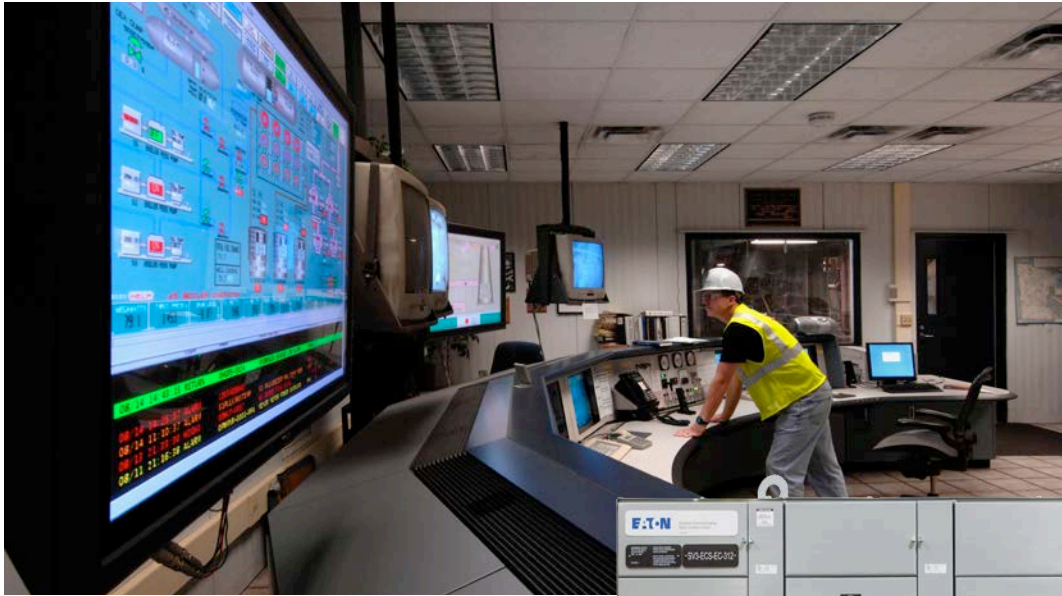


Intelligent motor control centers



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Introduction

Motor control centers (MCCs) provide monitoring and control for the operation of many critical process loads. When integrated with communications and smart end devices, this equipment becomes “smart” and enables actionable insight into the power system. Intelligent MCCs allow you to easily access data, make more informed decisions, and optimize the performance of your facility, process, and power system. Whether modernizing a facility, expanding operations for new processes, or building new facilities, intelligent MCCs can provide powerful system advantages.

Expansion at chemical plant focuses on uptime through scalable intelligence



Continuous processes emphasize need for remote monitoring

An expansion project at a chemical processing facility involved adding electrical infrastructure to support new processing capabilities. While there was a desire to incorporate features of smart MCCs, ensuring plant uptime was a primary objective. How would the new MCC lineups, fitted with hundreds of starters and adjustable speed drives provide monitoring and control data into the plant’s distributed control system (DCS)?

Easing into intelligent control

The existing facility had relied on traditional control methods and needed integration support into the plant control system. Eaton embedded intelligent motor protection relays and drives with network connectivity to provide monitoring capability along with parallel controls, enabling operation over the network (remotely) or locally (at the equipment).

During the project installation and commissioning, the customer was able to compress project timelines while adding intelligent control capabilities. Eaton and the DCS supplier worked together to provide tools to integrate the smart MCCs. Eaton also pre-commissioned the MCCs at the factory with customer-specified protections and setpoints. Further expediting the process, testing and commissioning could be performed while the equipment was already online. With Eaton’s intelligent MCCs, the expanded plant can easily harness new data, insights, and capabilities that support continuous process optimization.

Modernization of immense manufacturing facility enhances uptime and safety



New energy infrastructure for manufacturing plant upgrades decades-old equipment

The recent modernization and expansion of a manufacturing facility involved the replacement of boilers, warehouse, and production areas. The goal of the new electrical system design emphasized electrical safety and system availability. With operations spanning thousands of acres, the ability to monitor and control remote equipment and pinpoint issues was essential.

Intelligent maintenance: Fault detection impacts productivity

The power system modernization was a multipronged effort focused on safety and system availability. Existing ungrounded systems were converted to high-resistance grounded systems, reducing arc flash risk. The plant control systems were integrated with Eaton intelligent MCCs, enabling centralized monitoring and control. Additionally, smart motor protection relays incorporated an algorithm to detect the pulsing signal from the high-resistance grounding units. These relays alerted when a fault was present and determine the location for fast issue resolution.

New food and beverage plant uses MCCs for around-the-clock operations



Reliable, redundant networks are essential for continuous process industries

When one of the largest new food processing plants in the U.S. was being constructed, an effort to incorporate intelligent, connected MCCs was a focal point in the plant design. Planning for continuous operations, a high-performance control system was sought. With more than 1,000 intelligent motor control devices central to its operations, designing a reliable network infrastructure was a top priority.

Intelligent MCCs support multiple redundancy protocols

Network architecture was developed with communications to the plant control system to operate the process. Eaton constructed intelligent MCCs with industrial ethernet switches that supported multiple redundancy protocols. This allowed for network architectures to be created with redundant connections and should a link in the network fail, communications would be quickly restored. Additionally, the ethernet switches included combination uplink ports to facilitate communications over ethernet or fiber whenever equipment was located far away.

Global cement producer improves power reliability and productivity



New baghouse project

A global cement producer was upgrading facility process equipment to reduce emissions. Part of the project involved a new baghouse controlled from a PLC system. The added functionality from intelligent MCCs would improve motor protection and access to a host of electrical parameters—ultimately, improving plant reliability and productivity.

Spotlight on best practices in applying intelligent MCCs

The plant operations team and Eaton paved the path for a successful project with a compressed timeline. Eaton had its engineering experts meet with the customer's control engineers and local technicians at the plant to support configuration and network communications to integrate into the automation controller. For training and project configuration, Eaton sent sample components—including the measurement, control, and user interface module—to the project team. Eaton's manufacturing plant prepared the assembly with all network IDs for each motor management relay before it was shipped, and each device was preset with specific internet protocol (IP) network addresses based on customer specifications to further reduce commissioning time.

Regional wastewater facility gets insights for just-in-time maintenance



Lift station retrofit

A municipal wastewater facility in the Midwest has an average daily flow of about 11 million gallons, which can increase six-fold in the event of a major snow or rain event. This means that its pumps need to be able to operate at capacity, ensuring that the facility can manage increased flow levels and avoid adverse sewer problems for its 68,000 customers. Without SCADA information on the motor load conditions, maintenance personnel were routinely going 30 feet below ground to check on the health of pumps and motors.

Real-time monitoring prevents equipment failure

New intelligent relays were incorporated into the MCCs, enabling real-time monitoring of the line, load, and motor conditions remotely. With real-time insight into the system, maintenance personnel spotted a pump that was drawing 50 percent more energy than expected from headquarters. The intelligent relay delivered the insight to identify a problem, which turned out to be a foreign object wrapped around the impeller of the pump. This issue might have otherwise gone undetected.

