Customer Success Story:
Healthcare facility

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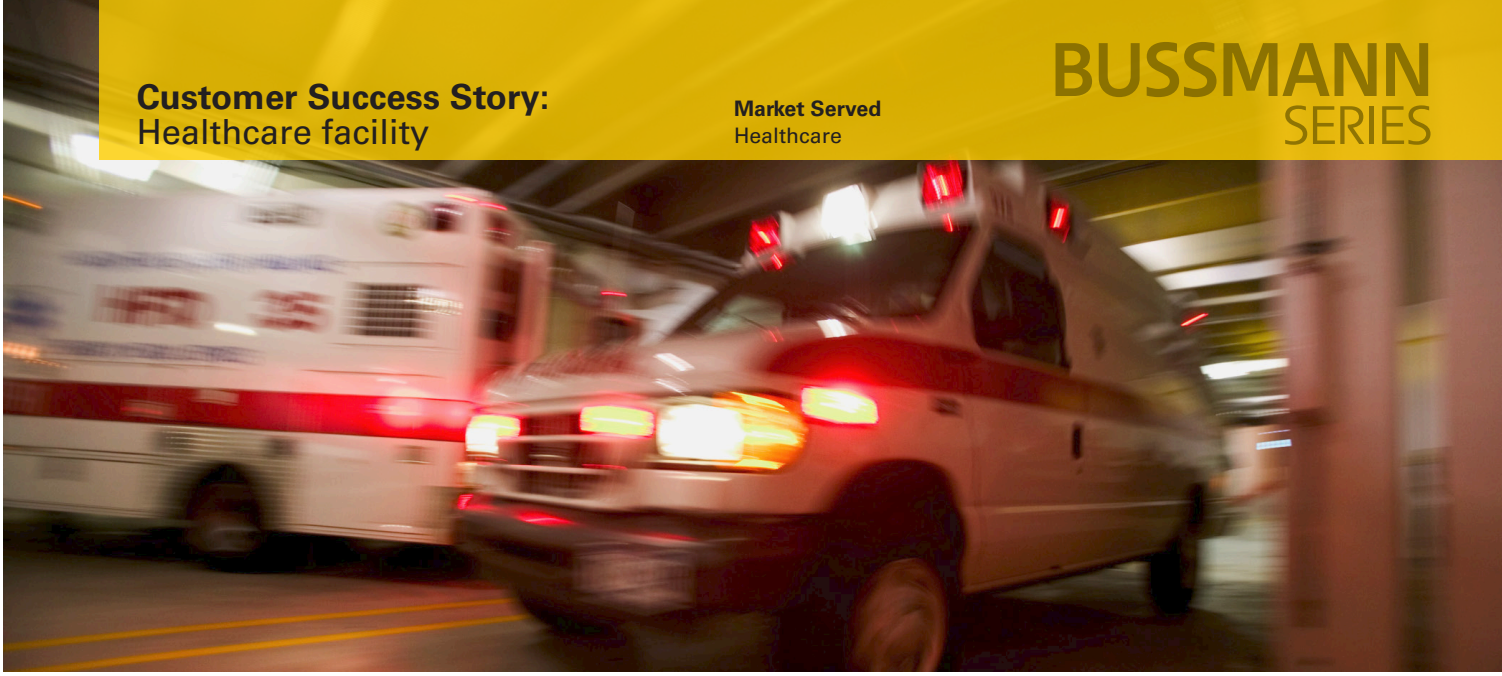

Major healthcare facility achieves selective coordination

Location:
Midwestern U.S.

Segment:
Healthcare facility specializing in rehabilitation

Challenge:
Develop an integrated power distribution and overcurrent protection system that exceeds National Electrical Code® (NEC) requirements for coordination of hospital essential electrical power systems.

Solution:
Hybrid fuse- and circuit breaker-based overcurrent protection system achieving selective coordination to provide the utmost in power system reliability and safety for patients, visitors and staff.

Results:
Simplified design, delivery and commissioning through the industry's only one-stop shop for fuse- and breaker-based solutions to solve power system design challenges with proven expertise and an unmatched product portfolio.

Background

Developing a safe and reliable power distribution system was top priority when a national leader in specialized rehabilitation programs for traumatic injury and pulmonary conditions began constructing a new 110-bed facility with a full spectrum of inpatient rehabilitation services.

Because the facility would be integrated with essential electrical systems and a vast array of sensitive electronic medical devices that require a certain level of reliability, engineering the right level of coordination was a key goal for power system designers. But determining the type of power distribution system that will meet code and project requirements can be a difficult process.

Selective coordination is achieved when an overcurrent condition on a circuit is interrupted and only the closest upstream device opens such that only the faulted section is taken offline.

Historically, the level of selectivity desired for a project was the choice of the system designer. However, 2005 and later editions of the National Electrical Code® (NEC) specifically define selective coordination in Article 100 and require selective coordination for critical power systems such as emergency, legally required standby and critical operation power systems.

Challenges

The 2014 NEC® has also modified the minimum requirements for coordination in healthcare essential electrical systems, as outlined in Essential Electrical Systems for Hospitals Coordination – 517.30(G). As described in 517.30(G), coordination is required for overcurrent protection devices for any fault extending beyond 0.1 seconds. These revisions to previous editions have lessened the requirement and no longer deem selective coordination (all overcurrent conditions and all overcurrent device operating times) mandatory for all systems.

As a result, the healthcare facility's electrical system designers were faced with the option to simply comply with local and national code requirements – or exceed coordination requirements for additional levels of safety and reliability.

Everything a healthcare organization does can be considered mission critical, and ensuring always-on power to safe guard patient care and facility operations is imperative to success. To this end, the healthcare facility turned to a proven leader in overcurrent protection to help develop an enhanced coordination system that would not only focus investment on patient care, but also ensure maximum power reliability and safety.

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Solutions

Because Eaton has more than 100 years of experience with power distribution applications and a deep understanding of the NEC®, the customer reached out to a local Eaton application engineer for support in designing the building's essential electrical power distribution system.

The Eaton team was able to offer a portfolio of component and assembly products as well as engineering support to help ensure the project was designed, installed and commissioned properly and cost efficiently – all in a timely manner to maintain project schedules.

After working closely with Eaton's application experts, the customer now has an essential electrical power distribution system that utilizes both circuit breakers and fuses to create a hybrid system that achieves selective coordination for a more reliable power distribution system.

At the core of the selectively coordinated system is a range of Bussmann® series Quik-Spec™ Coordination Panelboards (QSCPs), which make fuse and circuit breaker system selective coordination easy, from branch to source. By adhering to Eaton's published fuse and circuit breaker selective coordination tables, there was no need for plotting extensive time-current curves or undertaking costly studies to properly select selectively coordinated overcurrent protective devices.

Additionally, Eaton provided integral surge protective devices in life safety branch panels to comply with the 2014 NEC® 700.8 requirements for surge protection. To increase reliability, the integral surge protective devices were also added to the critical and equipment branch panels.

For enhanced personnel safety, QSCPs were installed that incorporate IP20 finger-safe Bussmann series Low-Peak™ CUBEFuses™ in conjunction with ampacity-rejecting Bussmann series Compact Circuit Protector Base (CCPB) UL 98 disconnects. This patented fuse ampacity rejection feature matches important standard branch circuit amp ratings to help prevent overfusing while maintaining optimum protection. Further, the panelboard offers a compact footprint up to 40 percent smaller than other fusible solutions – eliminating the need to reconfigure wall construction to accommodate panelboard placement.

Rounding out the hybrid system, Eaton also applied Pow-R-Line C switchboards with integrated surge protection to combine a space-saving design with modular construction and increased systems ratings to provide economical and dependable electrical system distribution and protection.

Metering solutions were also integrated within the switchboards for accurate power measurement and proactive power quality management, while embedded UL 1449 3rd Edition certified Bussmann series surge protective devices help ensure equipment is protected with the safest, most reliable and most advanced surge protection technology available today.

Finalizing the solution, the healthcare facility implemented Eaton heavy duty Bussmann series safety switches that meet UL 98 standards for safety, durability and reliability, and three-phase general purpose dry-type transformers for the energy efficient transformation of utility power.

To ensure the hybrid system was commissioned and installed correctly to exceed NEC® coordination requirements, Eaton's team of expert engineers completed the project with in-depth short-circuit and coordination studies – providing the customer with peace of mind that the system would operate reliably and safely as designed.

Results

Eaton's focus and core strength is delivering the right solution for the application. But, decision makers often demand more than just innovative products. They turn to Eaton for an unwavering commitment to personal support that makes customer success a top priority.

Although the level of selectivity desired for healthcare essential electrical system applications is ultimately the choice of the system designer, choosing to comply or exceed coordination requirements can be an extremely difficult challenge. To this end, it is always beneficial to consult with a proven leader in overcurrent protection to weigh the trade-offs of all possible overcurrent system designs.

And when it comes to circuit protection, only Eaton offers the broadest circuit protection and electrical safety solutions in the industry that enable customers to achieve code compliance effectively and economically. Adding additional benefit, Eaton also offers the technical expertise and regional engineering support structures to help achieve project goals, whether facing new construction, expansion or renovation.

By collaborating with Eaton to meet its selective coordination needs, the healthcare facility was ultimately able to:

- Achieve the most robust selectively coordinated system possible to ensure the maximum level of system reliability.
- Develop a cost effective solution to achieve selective coordination and other power system requirements.
- Tap the capabilities of the most experienced application experts and time-tested circuit breaker and fused solutions to meet national and local code requirements.
- Simplify design and supply chain requirements with the industry's only one-stop shop for fuse- and breaker-based coordination solutions to solve design challenges with proven expertise and an unmatched product portfolio.

To learn more, visit eaton.com/selectivecoordination.

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