Machine OEM uses Safety as a Competitive Advantage

How machine builders unlock automation efficiencies by designing safety into machines

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Challenge:

Find a safety system that didn't burden the engineering staff at Zerand with additional software and hardware applications.

Solution:

Rexroth's flexible safety technology allowed Zerand to use its existing controls system and co-processors, reducing the cost of implementation and increased productivity.

Results:

- **Continual monitoring and display capabilities of the equipment line.**

- **Standardized operation method thanks to integrated safety technology.**

- **Reduced downtime since there is no time lost when powering up after a lockdown.**

Overview

From working with machine builders for many years, Bosch Rexroth (Charlotte, NC, **www.boschrexroth-us.com**) observed that the number of machine builders in the United States integrating machine safety functions is still not the norm. In many cases, machine safety is still being considered as an afterthought. Machine safety is not a new concept, but the idea that safety can unlock a host of previously untapped production benefits is. If Rexroth's long experience working with machine builders has made us sure about one thing, it's this: Machine safety goes far beyond safe machine operations. It's a catalyst for productivity and can set companies apart in a competitive market.
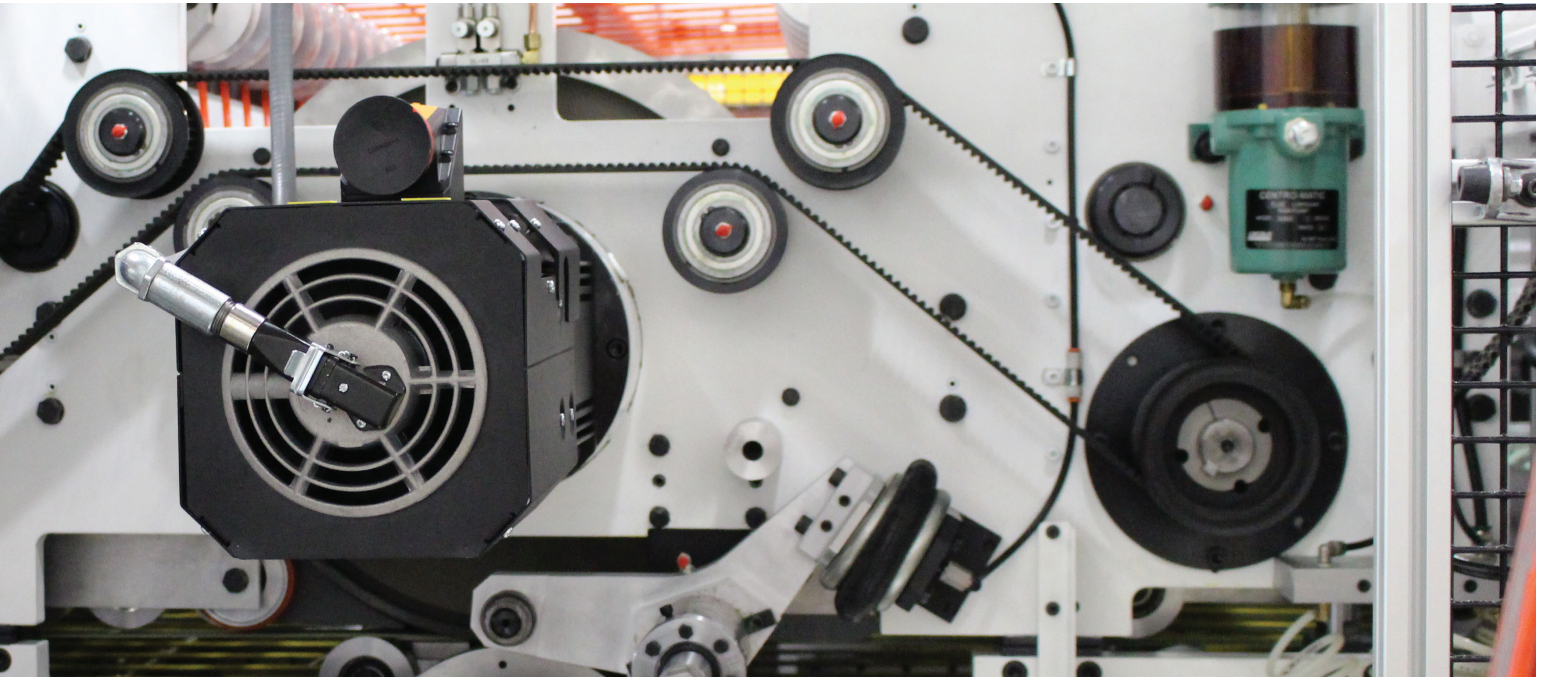
The Challenge of Safety

The paper-converting environment has typical industrial hazards and some that are industry specific. As a global leader in web-fed die cutting systems and solutions for the paperboard converting industry, no one understands these challenges better than BW Papersystems – Zerand (New Berlin, WI, **www.bwpapersystems.com**). A few of the standard industrial hazards include fast-moving webs, automated cycles, noisy working conditions and multiple machine operations running simultaneously. Dennis Gignac, Director of Engineering, BW Papersystems remarked, "Even the best machine operators can be distracted on occasion, putting them at risk of injury in the industrial environment. BW Papersystems – Zerand decided that it wanted to take the lead on designing inherently safe machine operations in its industry." The intent was to build safety into the line of equipment as an integral

part of the control systems rather than just as an afterthought that is awkwardly rushed onto the equipment last minute. Quality and reliability were key. Aside from compliance with industry-specific safety requirements, the most challenging thing about integrating machine safety requirements into the control system design is finding a safety system that does not burden engineering staff with additional hardware and software applications. Safety implementation that didn't require specialized machine control systems in order to maintain industry-standard machine control and operation proved to be a difficult find. Zerand's early investigation into safety technology found that many systems required proprietary communications buses or hardware configurable relays that were confusing, and ultimately, too costly for efficient implementation.

" **Even the best machine operators** can be distracted on occasion, putting them at risk of injury in the industrial environment..."

– Dennis Gignac, Director of Engineering | BW Papersystems

Rexroth's Solution

With the help of long-time distributor, CMA/Flodyne/Hydradyne (Brooksfield, WI, **www.cmafh.com**), Bosch Rexroth proved itself to be the right partner to implement safety functions when its safety technology allowed Zerand to utilize its existing control system as a base to add the safety technology. For Zerand, it was also important to have a close working relationship with their controls supplier in order to understand the best method of implementing new technology by leveraging the supplier's knowledge and experience. Between both CMA/Flodyne/Hydradyne and Rexroth's extensive knowledge of available products, the team was able to

evaluate different safety options and develop an implementation plan that addressed the specific safety needs of the paper-converting industry and Zerand's operations. Another attractive quality is that Bosch Rexroth's safety technology is a co-processor that simply plugged into the side of an existing controller, providing a redundant safety controller that could be integrated into the main control system and programmed through the same interface with industry certified safety instructions. This allowed the main controller and the safety controller to monitor each other to verify the integrity of the machine control.

The Benefits of Safety

Many people believe that the addition of integrated safety has to be a burden from a cost and time standpoint. Gignac pointed out, "Although there is an additional cost of integrating safety products into the equipment from the start, it can pay for itself by preventing injuries that cost production time to investigate and additional hardware to provide a remedy after an investigation." By integrating the safety technology into the control system, operators now have a standard method of operation that is clear and consistent. Operators no longer need to question if the machine is safe to work on or not since the system continuously monitors and displays the operational safety status of the equipment on each operator station and through area visual signaling. Additionally, downtime is reduced since there is no time lost when powering up the system after a lockout restart or loss of the process control as a result of web tension changes, machine phasing or other circumstances that results in wasted product upon restart. Finally, Rexroth's safety products implement safety over industry-standard communication networks, such as Profibus and ProfiNet. Since Zerand was already using these networks, Rexroth's ability to insert safety remote I/O without the need for a separate safety network was invaluable. When the labor and material cost of extending the existing hardwired safety controls throughout the line of equipment was removed, the incremental cost of implementing Bosch Rexroth's safety products was minimal with a high return on investment.

I4.0-ready

With Rexroth's control system, Zerand can continually monitor and display the safety status of our equipment line. The implemented software applications allow operators to verify the integrity and safe functionality of every safety device on equipment and provide reports of these verifications at the main operator console. In the future, Zerand plans to allow our customers to view the safety status and reports remotely through a web-based application if remote access is permitted.

Conclusion

BW Papersystem - Zerand's testimony speaks volumes about the benefits of integrated safety functions in industrial applications. Bosch Rexroth's SafeMotion and SafeLogic enabled BW Papersystems – Zerand to deliver significant productivity gains to their customers. The benefits of safety technology extend beyond keeping workers safe. Ultimately, integrating safety is not a daunting financial investment when the productivity benefits of applying safety functions in considered alongside employee satisfaction.

As machinery and employees must work together, operators can only work efficiently and achieve maximum productivity if the safety technology does not slow them down. Bosch Rexroth's standard compliant safety products help machine builders and manufacturers achieve machine safety requirements within the United States of America and abroad while increasing productivity and profitability.

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