

Encore Tissue's manufacturing plant upgrade drives increased productivity

The Global Solutions team from Rockwell Automation applied their engineering capabilities to customise a partial line upgrade that integrates with the existing system to improve tissue production rates.

Challenges

- To engineer a solution to upgrade the tissue machine's drives to increase the line speed of the machine

Solutions

Integrated control and safety

- GuardLogix® process automation controller with Ethernet communications
- Software interfacing with tissue machine control system

Drive upgrade

- PowerFlex® 755 (500kW & 250kW) drives replaced existing DC drives
- Tissue machine application software design and development based on drives standards
- Solution was designed to fit within existing space available in small switchroom

Results

Meeting current safety standards

- GuardLogix® process automation controller with Ethernet communications
- Guardmaster® door locking devices to prevent unauthorized access by plant personnel

Increased line speed of tissue machine

- The upgrade successfully increased the line speed of the tissue machine for increased production

Minimal interruption during commissioning

- Factory Acceptance Tests delivered integrated testing with hardware and simulation software prior to installation
- Local technical support during installation and startup



Encore's tissue machine has increased production output as a result of the upgrade

Background

Sustainability is a key component of Australia's pulp and paper industry. Advances in technology have provided the capability to reduce environmental impact, safety and support the ongoing sustainability of the tissue production process.

Encore Tissue is an Australian family owned business that was established in 1998 by the Holckner family, comprising of Charlie Holckner and his two sons, David and Mark Holckner.

Today, the company is a leading manufacturer of toilet tissue and kitchen towel with a manufacturing plant in Laverton North, Victoria. Encore's philosophy is to manufacture quality products and endeavour to be environmentally, socially and economically responsible.

The fibrous raw material is sourced from responsibly managed plantations and regrowth forests. The fibres are sourced from local and International suppliers who practice sustainable management of forests in line with strict international standards. All suppliers operate under Forest Stewardship Council accredited environmental systems and practices.

Encore Tissue is committed to achieving sustainable economic growth that is of benefit to present and future generations, without threatening the resources or biological systems of the world in which we operate.

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The company is committed to constant improvement in its manufacturing process as it grows into a major player within the industry. As testament to this commitment, Encore Tissue decided to undertake an upgrade to part of their tissue production line to keep in touch with the latest technology, increase production output and help their customers by providing a better quality product that exceeds their requirements.

The scope of the project was to upgrade the original tissue machine, which was commissioned back in 2003 to incorporate new technologies and improve production rates.

Driving increased tissue production

The original tissue machine at Encore originated from Italy and had Reliance Automation components, which were supplied by Rockwell Automation. The tissue machine was relocated from Velcarta in the south of Italy and was installed in 2002/2003 at Encore Tissue's Laverton North site, which enabled Encore to supply a full range of multi virgin and recycled converted tissue products. During the relocation of the tissue machine, the original end of life Reliance DC drives were upgraded to newer FlexPak 3000 DC drives, beginning the relationship between Encore Tissue and Rockwell Automation. However, as demand continued to grow for Encore's products, the original tissue machine required an upgrade that would use new technology to improve quality and output.

According to Mark Camilleri, project manager at Encore Tissue, "We have enjoyed a longstanding relationship with Rockwell Automation. The company upgraded our drives back in 2003 so when we were embarking on the latest line upgrade, we invited them to tender for the project and once again, their approach, solution and capabilities made them the most logical choice."

The tissue making process starts with pulp that is approximately 99.8 percent water and 0.2 percent fibre. This pulp is pumped by a large pump called a fan pump onto the machine, through a head box, which distributes the pulp onto a forming fabric creating the tissue sheet. The tissue sheet is then transferred onto a felt and transported through the machine. The felt passes over a suction roll, which removes some of the water from the sheet before the tissue sheet is transferred onto a large steam heated and pressurised drum called a Yankee Dryer. The Yankee Dryer further dries the tissue sheet, aided by gas heated hoods until the sheet is 95 percent fibre and only 5 percent water before it is creped off the Yankee and wound onto paper cores by the pope reeler, creating the finished parent reel.

To gain additional kilowatts and increase production output with the new machine, the fan pump, forming roll and suction press drives were upgraded from FlexPak 3000 DC drives with four new PowerFlex® 755 AC drives and the existing control system was upgraded to GuardLogix® to address safety requirements.



New upgrade hardware integrated with the existing system.

"As part of the design process we went to the plant to measure the room to see if the drives fit within the existing space, but because the footprint of the AC drive is much larger than the DC drives, we had to change the configuration of the drive so it would fit in the room. This involved reversing the arrangement of some of the drives and putting the circuit breaker panels on the left hand side, instead of the right side so they were aligned with the high beams in the roof," said Peter Tomazic, senior solutions consultant at Rockwell Automation.

"The tissue machine required a high current system, the incoming feed was 4000amps so this involved finding a suitably rated busbar system. Also, because at least 50 percent of the cabinet was retained we had to ensure that it married up with those existing cabinets and the system was integrated effectively," he explained.

According Mark Camilleri, "To continue to grow the business we need to keep in touch with the latest technology and provide a high quality product to our customers. The team at Rockwell Automation were able to customise our panels and solution to suit our requirements and maximise our output."

GuardLogix was used to combine control and safety in the one platform, as well as reduced installation costs and setup times.

Integrated safety that complies with current and future standards

Encore is committed to improving its manufacturing process and also to meeting safety requirements. Back when the tissue machine was initially commissioned, ControlNet was the network used for the drive system control as Ethernet was not yet mature enough. Now, Ethernet provides the capabilities to do all the coordinated drive system control as well as safety and standard IO on the one network.

"As part of the upgrade, GuardLogix was used to combine control and safety in the one platform and helped the plant meet current and future safety regulations. Another benefit of this integrated control and safety is that installation costs and set up times were reduced. Additionally, we also used Allen-Bradley® Guardmaster® door locking devices to prevent the unauthorised access of plant personnel to the reel section of the machine when it is in state that could be dangerous," said Matthew Barrett, senior project engineer at Rockwell Automation.



GuardLogix controlling the drive system as well as machine safety circuits.

Software customisation

According to Matthew Barrett, "Supplying the product is the easy part but understanding how it is engineered to run is much more challenging. With this sort of equipment you need to make sure the drives are running at the same speed to avoid mechanical damage or breaks so there is a fair amount of smarts in the way you engineer the drives. We have developed libraries of software for these sorts of applications as a result of years of experience that saves engineering time and improves reliability."

The Encore site has now evolved through three generations of Rockwell Automation solutions and has gradually migrated equipment so that down the track when any remaining equipment needs to be updated, they will be able to do so easily.

"Being able to migrate in stages is good from an economics point of view and there is a lot of flexibility in the product which makes integration of the new solution with our existing equipment seamless," said Mark Camillieri."

As part of the system test, a full factory test was conducted to minimise downtime upon installation. This

demonstrated that the whole system was working as a dry system and also validated a few functions. During the commissioning process there was a standard protocol that was followed which made installation easy and ensured that there was no downtime involved.

Sustainable lifecycle

According to David Holckner, director at Encore Tissue, "Today we have three generations of Holckner family members working together supported by a dedicated management team, and we are all looking forward to the challenge of continuing to build our business, offering our customers improved tissue quality and innovative products with our new capability."

Water is a key resource in paper manufacturing and trying to reduce water usage has been a key project for Encore Tissue. Since commencement, the amount of water used per tonne of paper manufactured has reduced by 65 percent. This has been largely due to reusing and recycling water within the manufacturing process.

"The solution is more energy efficient and helps us to use less water in the manufacturing process, especially as we get it up and running to full capacity. Integration and commissioning was straightforward which meant we were up and running with no significant downtime and we are already familiar with the look and feel of the product



Guardmaster solenoid locking switches used for protection of personnel and machine.

which makes it easy to operate. As a result of the solution, the tissue machine now has increased output which was our key business driver," said Mark Camillieri.

"We have enjoyed working with Rockwell Automation, they are a very professional company that knows their product well. They are easy to work with and provide flexibility within their product and services so we would not have any hesitation in recommending Rockwell Automation to other customers," he said.

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