

Intelligent motor control delivers information and safety for explosives manufacturing plant

A new explosives manufacturing plant in Europe invests in the latest motor control technology from Australia

Challenge

To design and build equipment for a new explosives manufacturing plant that leverages the latest intelligent motor control technologies.

Solutions

Intelligent motor control

- The Allen-Bradley® CENTERLINE® 2500 MCC with Rockwell Automation® Connected Components and ArcShield™ protection delivered advanced motor control.

Easy transport and assembly

- The complete system was built as a containerised solution and assembled and tested prior to being packed and shipped to Europe.

Results

Reduced engineering time

- Engineering and testing was performed prior to shipping for easy commissioning upon arrival.

Safe & smart production

- The solution incorporates a high level of safety, automation and control.



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Background

The Australian explosives manufacturing industry has earned an enviable reputation as a global leader in the manufacture of explosives as well as providing the required infrastructure and equipment for the explosives industry both within Australia and around the world.

International Explosives Equipment (IEE) is one of the world's leading mining explosives equipment manufacturer and supplier. The company manufactures in their custom built facility in Western Australia.

When tasked with building a new explosives manufacturing plant in a remote part of Eastern Europe, IEE knew that there were a number of regulatory and environmental considerations to be addressed. IEE called on Auto Control Systems (ACS), a recognised Rockwell Automation System Integrator and provider of industrial automation, control systems and services based in Perth, Australia. Within the scope of the project, ACS was responsible for delivering the automation and electrical components of the plant.

The key to the success of the project was to design and build the explosives equipment to meet the production requirements of plant while taking into account the unique environmental factors and transportation logistics.

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Intelligent motor control

Motor control technologies have advanced rapidly, delivering tighter integration between devices and access to data. These advances provide actionable information to help optimise operations. According to Andrew Taylor, engineering & operations manager, ACS, "Customers around the world are growing more aware of international regulations, including IEC regulations around the Motor Control Centre (MCC) and safety so they are really looking for solutions to meet these criteria."

IEE, ACS and the end user collaborated on the programming requirements for operating the production facility incorporating a high level of safety, automation and control.

The Allen-Bradley® CENTERLINE® 2500 MCC from Rockwell Automation was selected as the most appropriate choice for this application. The MCC features the complete Rockwell Automation Connected Components range, including E300™ Electronic Overloads and PowerFlex® 525 and 753 drives all on an Ethernet backbone.

"One of the key considerations for international customers is that they are able to find support for their equipment locally. Rockwell Automation has a large install base and support all over the world so this provided some reassurance should a problem arise," explained Andrew.



PowerFlex 525 drives with built in safe torque off helped achieve a Category 3 machine safety with no additional hardware for the drives.

To minimise any potential downtime the MCC was assembled as two completely independent systems; with two separate CompactLogix™ controllers and two PanelView™ terminals. Each system was responsible for running two different processes, so if one system needs maintenance, the other part of the plant can continue to run with no interruption.



All motor control equipment has an external hardware interface module to display performance information at the front of the MCC.

“The CENTERLINE MCC also provides the functionality to remove a component for maintenance, close the door and continue to run without any danger to the operators. If you compare this to the older MCCs, you would need to shut down the whole system while the component in question was being worked on,” said Andrew.

“The solution was developed using Studio 5000® and we also incorporated aspects of the PlantPAx® libraries. The temperature, pressure and flow equipment is all supplied by Endress+Hauser which integrates well with the Rockwell Automation system,” explained Andrew.

The plant used Ethernet communications to provide the capability for premier integration of the Rockwell Automation Connected Components as well as mass flow meters from Endress+Hauser, a Rockwell Automation Strategic Alliance Partner.

The complete system was built as a containerised solution and assembled and tested prior to being packed and shipped to Europe. Upon arrival the system will be installed and commissioned by engineers from the enduser plant and ACS.

Safety first

As the MCC is operating in close proximity to the operators, ArcShield™ protection was included in addition to the Rockwell Automation Connected Components. ArcShield helps to reduce arc flash hazards and provides increased protection against electrical arcing faults.

The MCC also features IntelliCENTER® technology, which enhances the intelligence of the MCC by using built-in networking to capture information that can be used for predictive maintenance, process monitoring, and advanced diagnostics. Connecting motor control devices



The solution incorporates a high level of safety, automation and control.



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over Ethernet allows operators to realise the benefits of the Connected Enterprise by monitoring and analysing operations from anywhere at anytime.

“The international certification via IEC61439 combined with ArcShield protection helped the customer to feel relaxed in the knowledge that they are purchasing a superior product, which provides the highest levels of protection for their operations staff,” explained Andrew.

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“In addition the equipment that is included as part of the MCC allowed us to achieve a high category of machine safety, for example we can use PowerFlex 525 drives with built in safe torque off and achieve a Category 3 machine safety with no additional hardware for the drives,” he said. ACS leveraged their engineering expertise to incorporate several custom selections, including a light and power distribution chassis, PLC tier including dual CompactLogix controllers and Stratix® switches, and custom heat trace control cubicle. All motor control equipment has an external hardware interface module to display performance information at the front of the MCC.

Success through collaboration

ACS is the first Recognised System Integrator (RcSI) in the Power Discipline for the South Pacific region. The company is also the first recognised Low Voltage (LV) MCC SI in the world to implement an Allen-Bradley CENTERLINE 2500 MCC.

The System Integrator program, part of the Rockwell Automation PartnerNetwork® program, is designed to educate and produce qualified partners who are able to help solve production challenges by advising on and delivering the best solution. Within this discipline, ACS is focused on delivering Low Voltage MCC solutions leveraging the Rockwell Automation Integrated Architecture® Platform.

According to Michael Massey, state manager, Western Australia, Rockwell Automation, "This project marks an important milestone in our relationship with ACS and gives us the flexibility to address market requirements in providing comprehensive type tested, intelligent MCC solutions that can be locally customised and supported by a competent LV MCC Recognised System Integrator with backing from our factory."

The LV MCC Power System Integrator Program provides a mutually beneficial relationship, whereby together with ACS and Rockwell Automation customers can configure and utilise the technology to leverage the Connected Enterprise and meet their operational and productivity requirements.



The CENTERLINE MCC provides the functionality to remove a component for maintenance, while keeping the system running.



Rockwell Automation and PartnerNetwork companies collaborate to help you develop an ongoing approach to plant-wide optimization, improve your machine performance and achieve your sustainability objectives.

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Auto Control Systems specialise in all aspects of Mining, Transport, Marine, Agricultural and Heavy Industry. Auto Control Systems are able to design, produce, install and maintain any type of system, from rudimentary warning lights and switches to PLC control, remote controls, data logging and automation.

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