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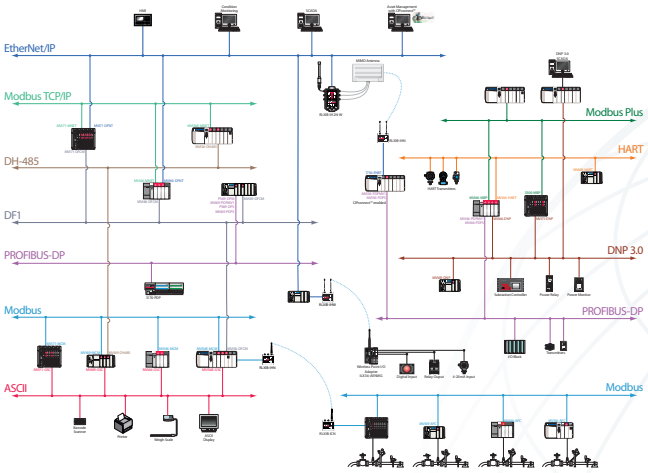

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Rockwell Automation NV
Pegasus Park
De Kleetlaan 12A
B-1831 Diegem

Tel +32 2 663 06 00
Fax +32 2 663 06 40

For further information please contact your account manager or send us an e-mail at **info_at@ra.rockwell.com**

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Welcome to this Edition of Automation Today

The process industry is one of the most challenging industrial sectors on the planet; with customer demands, national and local legislation and price sensitivity driving all facets of the industry's business model.

As a global supplier to many of the world's most famous brands in health, chemical, food and beverage and pharmaceutical, Rockwell Automation is in an incredibly strong position to help our customers not only address current challenges, but to also provide a solid platform for future expansion and performance enhancements.

Our PlantPAx solution provides a seamless, scalable, single-platform approach to addressing the most pressing needs of the process industry. With transparency and interoperability at all levels, it offers easy accessibility of vital data, fostering an environment of better information and more intelligence-based business decisions.

Companies small or large can take advantage of our capabilities, domain experience and partner programmes; but don't just take our word for it, read on...this issue of *Automation Today* details many of our strengths and covers some of our most impressive success stories.

If you have any comments or questions, please do not hesitate to contact us.

Hedwig Maes
President – EMEA Region
Rockwell Automation

Contents

PlantPAx: The Best of DCS and PLC/SCADA

Traditionally there have been two choices when selecting a process control system – a Distributed Control System (DCS) or a PLC/SCADA approach. Both systems have strengths and weaknesses, however, PlantPAx from Rockwell Automation uses the best from both worlds in a single, scalable solution.

The key benefit of a DCS system is that suppliers took a 'systems approach' and the control system was designed for large-scale applications. Much of the hard work of integrating different parts of the system was taken care of by the DCS vendor by using a single database.

The DCS approach is to configure the system using standard control objects that are automatically linked to the appropriate faceplate, simplifying configuration and leading to standardisation. There are, however, a number of shortcomings. Many applications have a large number of packaged equipment (OEM packages) from other suppliers that need to be integrated and it is unlikely that these suppliers will want to use a DCS for their control system because of the cost or capability.

If the packaged equipment comes with a PLC this means there are two different control systems on-site, which will increase overall costs. In many cases it will be impractical to integrate the control elements of packaged equipment directly into the DCS. It will also be difficult for the package supplier to test the equipment or provide process guarantees unless they provide the control system. With the trend to more modular build of process plants these issues become more pronounced.

Traditionally a DCS has been expensive to support throughout its life, with annual licensing and support costs being a significant part of the overall cost. The majority of DCSs are engineered and supported by the original manufacturer and are not freely available through other channels. This leaves the end user very reliant on the DCS vendor to provide a cost effective service and restricts the users' options if this is not the case.

The PLC/SCADA Approach

Originally developed for discrete applications, PLCs can now cover a wide range of applications. The term Programmable Automation Controller (PAC) is now used to describe many products to distinguish them from older systems that were focused on discrete logic. This approach is very flexible – multiple programming languages, open communications, scalable for different applications.

There are a wide range of Systems Integrators with specific industry or application knowledge that can integrate PLC/PAC technology. This approach is also ideal for OEMs (original equipment manufacturers) who can select a cost-effective product to meet their requirements. The flexibility and power of PLC/PAC solutions and off-the-shelf availability has made them the product of choice for many end users.

Although PLCs and PACs have become more powerful there are a number of features that are missing when compared to a DCS. Users often have to configure the PLC database and then separately configure the database in the SCADA system. Another potential weakness is that not all PLCs have features required for highly demanding continuous process control applications.

Process optimisation and asset management is another area where traditional PLCs may be lacking when compared to a DCS, which will typically offer a number of tools for optimising control loops and more advanced alternatives to PID control to improve performance. Also, traditional PLCs may be lacking the features required to maximise the benefits of smart field devices and asset management packages.

Combining the Best of Both Worlds

The PlantPAx Process Automation System has been designed to take the best of both worlds. It combines the 'systems approach' of a DCS and flexibility of a PLC to provide a system that is ideal for multiple applications. PlantPAx is also part of our Integrated Architecture, a true plant-wide architecture that is designed to cover a range of disciplines including Continuous Process, Batch Process, Discrete Control, Motion and Drive Control, Machine and Process Safety.

PlantPAx eliminates the need to choose between using a DCS or a PLC/SCADA approach. It has been designed to take the best features from both and integrate them into a single scalable solution. As part of the Rockwell Automation Integrated Architecture™ it allows a single architecture to be used for a wide range of applications including process, batch, drives, motion and safety.

At its core, PlantPAx is a single database that also has a single security model, simplifying the management of user's profiles. In addition, any data created in the system is instantly accessible to all the software modules that need it.

PlantPAx is also scalable for small OEM packages with less than 100 I/O points to a large scale distributed system with multiple controllers, hundreds of control loops and more than 10,000 I/O. All the systems use the same instructions, communications networks and visualisation development platform. This allows users to select one architecture for the whole plant; scale up from pilot plant to full scale production using the same architecture; build a modular plant and integrate into a single system; and integrate packaged equipment that use PlantPAx.

It offers high availability at all levels of the system from redundant I/O and networks through to controllers and supervisory systems. And, if the application requires a safety system, there is a full range of options, ranging from failsafe SIL1 systems through to fault-tolerant SIL3 systems.

Asset management options allow users to manage configurations, implement backup regimes, track user action, configure field instruments and be alerted to potential problems. PlantPAx supports open FDT/DTM technology to provide asset management for a wide range of instruments connected on HART, Profibus or Foundation Fieldbus. It also supports direct connection to the latest generation of instruments from Endress+Hauser and others on Ethernet/IP.

PlantPAx systems can be engineered by end users, Systems Integrators, OEMs or our

Solutions and Services Business (SSB) systems group. There is a large network of Systems Integrators worldwide who have vast application expertise and can provide PlantPAx solutions tailored to your requirement. In many cases they can provide local support and specific application experience.

For more information, e-mail us at:
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with ref: PCS Comparison

Achieving high availability in process applications

According to the ARC Advisory Group the global process industry loses $20 billion; or 5% of annual production, due to unscheduled downtime and poor quality. ARC estimates that almost 80% of these losses are preventable and 40% of the preventable losses are due to operator effectiveness issues in the control room.

Trying to making sure production doesn't stop due to things like product failures, damage or maintenance, generally involves implementing a high-availability automation system. Without this in place, manufacturers can experience unscheduled downtime and poor quality, which impacts production schedules, the ability to meet customer commitments and, of course, company profitability.

Thanks to ever-evolving technology, scalable product offerings and design best practices, stakeholders now have more ways to improve operational effectiveness and achieve high availability. Manufacturers simply need to examine their critical processes and apply the method(s) and technology that best safeguard their critical operations and match their economic and performance requirements.

High Availability Defined

Defined as the probability that a system is operating successfully when needed, availability is most often expressed as a percentage and referred to as the 'number of nines.' Simply put, availability is the proportion of time a system is in functioning condition and able to perform its mission.

Availability = MTBF/MTBF+MTTR, where MTBF is the mean time between failure and MTTR is the mean time to repair. Today, suppliers deliver control systems with availability typically ranging from 99 to 99.9999%. As reliability affects uptime and maintainability affects downtime, these two elements are important contributors to availability.

However, investing in a high availability system over simply 'an available one' can make a significant difference in lost time or costs – seconds vs. days or hundreds vs. millions of dollars. The average hour of plant downtime roughly costs $12,500, but is substantially more at many continuous process plants, according to ARC research. Using the $12,500 average, downtime for users with 99% availability can cost an estimated $1,050,000 per year, compared to just $104 for users with 99.9999% availability.

Workplace Trends

Several key trends contribute to unscheduled downtime and system availability. First and foremost is the changing workforce. Baby boomers are starting to retire in droves, taking with them decades of experience while manufacturers are also trimming their workforce to save costs. For these reasons manufacturers are leaning more heavily on outside service providers. Meanwhile, the economic downturn reduced financial resources to upgrade and replace aging equipment, leading to increased downtime, driving manufacturers to look for reliable and easy-to-maintain systems.

The Use of Redundancy

Redundancy is the method of choice for increasing availability if a control system shutdown or loss of visibility causes a major loss of revenue, loss of equipment, injury to people or a disruption to public services. While most users traditionally leverage redundancy to achieve high availability, this method increases the number of components, thus increasing the number of potential component failures. Therefore, redundancy – if not applied properly – can effect system availability. To avoid weighing

down a system with redundancy overload, process manufacturers should determine the cost of potential failures and make high availability investments accordingly.

In addition to proactive methods, manufacturers are looking to 'reactive' measures – most commonly maintenance procedures and tools – to help increase system availability. A control system must be easy to troubleshoot, modify and repair. Personnel should be qualified and trained, and they should be able to remove and add components to the system without interrupting the mission. Consequently, replacements should not require rewiring or reprogramming.

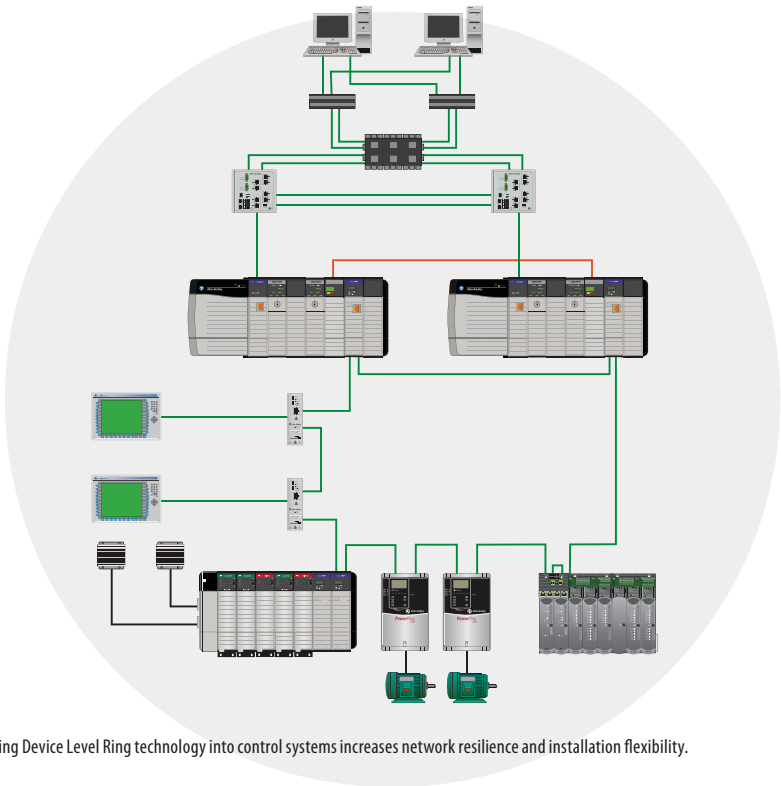
Further, to best match a manufacturer's criteria, both now and in the future, forward-thinking suppliers have forged a new dimension of scalability. Modern process control systems can now manage more than the traditional continuous closed-loop process control – they manage batch processing, drive and motor control, safety and critical control and discrete control such as sequencing for packaging – all allowing access to production information and on a single control platform.

Improving Availability

Smart instrumentation and advanced networking technologies improve system availability with real-time access to vital diagnostics that help predict and prevent component and system failure. This diagnostic functionality – along with additional process data these devices provide – is integrated into software that benefits users with upfront alarms, calibration and model information.

EtherNet/IP has become the world's leading standard, unmodified industrial Ethernet network as it provides a simple yet robust communications platform offering real-time control and information flow from the instrumentation level to the IT enterprise. It is the only protocol that offers discrete, process, safety, motion and drive applications on a single network, eliminating the need for additional specialty networks.

Defined as the probability that a system is operating successfully when needed,availability is most often expressed as a percentage and referred to as the 'number of nines'.



Embedding Device Level Ring technology into control systems increases network resilience and installation flexibility.

Maximising Availability

Historically, the process manufacturing industry has viewed deploying full redundancy into systems as expensive but necessary. However, with ever-evolving technology, scalable product offerings and new design best practices, this view is changing. Some manufacturers may specify a completely redundant system or a manufacturer that can tolerate some repair time might scale redundancy to only critical assets. Process engineers must apply the high-availability methods that best match their performance and economic requirements and, in so doing, mitigate potential hazards and protect important, expensive assets.

New Solutions

Rockwell Automation continues to expand its PlantPAx Process Automation System to help meet high availability demands more easily and cost-effectively. The expansion includes:

- Allen-Bradley® ControlLogix® L7 programmable automation controllers and RSLogix® 5000 v19.50 firmware, which, in combination, helps improve performance and provide fast cross loading for redundancy systems.
- 1715 redundant I/O, which provides redundant input and output modules, including analogue outputs configured by RSLogix5000 software and supporting redundant Ethernet adaptors all with no additional programming required.
- FactoryTalk® SE View 6.0, which supports alarm and event server redundancy for auto synchronisation of device and tag-based alarms between active and standby servers and a single alarm history configuration.
- EtherNet/IP I/O. Device Level Ring, Star and other EtherNet/IP topologies provide scalable resiliency and fault tolerance to meet all network availability, cost and performance requirements.

For more information, please visit:
www.rockwellautomation.com/go/prps
www.rockwellautomation.com/go/tj10pr

Or, e-mail us at: info_at@ra.rockwell.com with ref: High availability

This article is based on the white paper "Achieving High Availability in Process Applications" (PROCES-WP004A-EN-P) by By Art Pietrzyk, Segment Manager, Rockwell Automation.

Power through productive partnerships

The strength of a manufacturing and process industry partner network can bring you real business value and competitive advantage.

Many manufacturing and process industry companies have experienced an increase in growth and profits thanks to discovering the true value of partnerships, especially those that lead to short- and long-term growth.

As the Board on Manufacturing and Engineering Design in the USA described in its 'Visionary Manufacturing Challenges for 2020' report (http://bit.ly/eBD95p), "companies [in the year 2020] will be aggregations of people connected to each other by mutual trust and supported by an alliance infrastructure".

Indeed, one of the new realities being witnessed is a shift from a 'company vs. company' style of competition to 'network vs. network'. The strength of your company's network – including its upstream and downstream partners – will ultimately determine your ability to survive and compete.

The Rockwell Automation PartnerNetwork is an extensive community of partner companies that specialise in implementing and servicing Rockwell Automation solutions and complementary technology.

To help you keep pace with demand and implement the most efficient, effective automation and process systems available, the Rockwell Automation PartnerNetwork provides a critical resource. Member companies offer access to the knowledge of thousands of specialists in industries, applications, technologies, services and geographies around the world.

By taking advantage of the network, you could get your products and services to market faster, reduce total cost of ownership, use energy and plant-floor assets more effectively and minimise risks.

The PartnerNetwork framework is built on three themes:

1. Trust.
2. Collaboration.
3. Shared business values.

These principles guide every facet of the programme, from defining and selecting partners, to delivering scalable, best-in-breed solutions; ultimately translating into automation and process solutions not found with any other supplier.

Here is how trust, collaboration and business value are defined in the context of the PartnerNetwork programme:

Trust: The cornerstone of the PartnerNetwork framework; defined as strategic intent, open communications and mutual respect. Rockwell Automation and its partners share a commitment to doing what is best for customers: exchanging best practices, developing leading-edge solutions and working together to solve challenges.

It requires a mutual understanding of rewards gained from doing business together, executed seamlessly in the eyes of customers and supported throughout the solution's life cycle.

Collaboration: This is the creation of multi-level relationships and executing co-ordinated planning, sales and marketing among the partners.

PartnerNetwork™

Rockwell Automation recognises that no individual organisation can command all the relevant technologies needed for success. The PartnerNetwork programme offers a wealth of well-managed relationships established to create customised, best-in-breed solutions for customers; regardless of their size or location.

Shared Business Values: Partner companies share a common customer-first value.

We have established criteria for each partner type... each member of the PartnerNetwork is invited to join the programme only after we have vetted the partner's capabilities and established that they're committed to meeting industry and local standards and conduct business ethically.

A Network Approach to Business

We have maintained collaborative, trusted and mutually beneficial business relationships for years. In fact, our network of independent distributors that carry out the majority of our sales transactions date back to the 1920s.

The types of companies with whom we collaborate fall into one of three categories:

Business enterprise include strategic alliance partners and enterprise solution providers who work with us to develop, connect and deploy production systems that enable true plant-wide and enterprise-wide optimisation. These partners share product development plans and technologies and often bring industry-specific knowledge required for many automation projects.

Sales and solutions include distributors, Recognised System Integrators and solution providers. They partner with customers throughout the decision-making process to design, implement and support their automation investment. Machine builder

partners provide high-quality, innovative machinery that feature the latest Rockwell Automation technology.

Products and technology include Encompass™ third-party product-referencing programme participants and companies that license Rockwell Software® solutions, hardware and firmware products to offer Rockwell Automation-enabled solutions. Collectively, these partners deliver technology that integrates with our solutions to solve manufacturer application challenges.

Partnering for Your Success

Our best-in-breed solutions coupled with our extensive community of partners offer you the confidence that comes from working with a single-source supplier. We truly believe that when we successfully collaborate with and among partners, we collectively devise the best long-term solution for you.

Rockwell Automation PartnerNetwork
www.rockwellautomation.com/partners

For more information, e-mail us at:
info_at@ra.rockwell.com
with ref: Partnering

HPV Engineering meets worldwide manufacturing standards set by leading home and healthcare company

Process equipment builder designs plug-and-play flexibility for its customer, using Rockwell Automation's process solutions and expertise.

Background

Established in 1995, Czech company HPV Engineering is a specialist in the design, assembly and commissioning of bespoke plug-and-play skids for the process industry.

Up to 90% of its work is dedicated to supporting one of the world's most widely-recognised manufacturers of home and healthcare products. Owner of 300 leading household goods brands, the customer has operations in 80 countries and employs 135,000 people worldwide.

Rockwell Automation's products and consultancy services play a huge role in this relationship, helping HPV Engineering to address a broad range of its customer's needs which vary greatly in scope, range and application.

Challenge

With many global manufacturing companies now operating across multiple installations at global locations, the need for a set of common manufacturing procedures and standards is becoming more prevalent. The adoption of a single equipment standard makes worldwide manufacturing operations far easier to operate and maintain, as successes can be mirrored and issues more easily resolved.

For all these customer benefits, the process equipment builders supplying them can face many challenges.

Suppliers and machine builders who cannot rely on a worldwide support and supply network could see business opportunities limited. Equipment builders offering comprehensive and reliable support and supply will take the lead.

In the case of HPV Engineering, its customer had already undertaken this common-platform step and standardised on Rockwell Automation process solutions across all of its worldwide manufacturing operations.

Solution

"Our speciality," explains Karel Vetešník, CEO of HPV Engineering, "is pre-fabricated skids that offer plug-and-play capabilities. They contain all of the necessary equipment to be able to operate immediately. All the customer has to do is connect the pipes, the power supply and the communications and they are away."

"The control solution, power systems and all other electrical parts on board are Allen-Bradley products," Vetešník continues, "and the software used to drive the skid is also supplied by Rockwell Automation."

HPV Engineering also took advantage of the skills and resources available from Rockwell Automation's consultants who have helped to create the software and interfaces necessary for connection to the rest of the plant.

> *"It is fair to say that if there was no customer standard, then Rockwell Automation would be our first choice, its systems and its whole approach to automation make it easier to design and develop solutions."*

Results

"We were committed to using Allen-Bradley products from Rockwell Automation, due to our customer's worldwide standardisation policy. However, I can see huge potential business advantages to those who may not yet have opted to go with Rockwell Automation, primarily due to its significant presence in the process industry and its discrete machine control solutions, coupled with its own worldwide capabilities. I know for a fact that our customer is not the only multinational to have standardised on Allen-Bradley."

"I think it is fair to say that if there was no customer standard, then Rockwell Automation would be our first choice," Vetešník elaborates. "Its systems and its

whole approach to automation make it easier to design and develop solutions."

Commenting on the relationship HPV has with Rockwell Automation in the Czech Republic, Vetešník explains: "We are lucky to have a local Rockwell Automation distributor very close to us – we are very happy with the service. In instances where we need more in-depth technical help or answers to specific questions, our Rockwell Automation account manager is always on hand."

Vetešník concludes: "The flexibility we experience with Rockwell Automation's engineers is superb. Considering the distances between us and their offices, we still get the level of support you would expect if they were close neighbours – it is a very good experience."

For more information, e-mail us at:
info_at@ra.rockwell.com
with ref: HPV

ACS Dobfar employs PlantPAx for precise control of new downstream installation

Leading pharmaceutical company turns its hand to fish food, using existing fermenter and state-of-the-art process control solution from Rockwell Automation.

Solutions

A Rockwell Automation solution was installed, which included:

- PlantPAx solution
- FactoryTalk®
- Redundant Allen-Bradley® 1756-L63 ControlLogix® PAC
- Redundant HMI Server
- Modbus communication card
- HART Analogue I/O Card
- Rockwell Automation support from its Global Solutions and Services and Solutions organisations

Results

- Time-sensitive project finished on time
- State of the art downstream processing solution
- Compatibility with future Rockwell Automation-based DCS installations
- Easy management of Hart Modules
- Easier monitoring and problem solving
- Greater flexibility

ACS Dobfar, a privately owned Italian Company, owns 13 production sites, seven of which are US FDA inspected. It is among the top five chemical pharmaceutical companies in the world and is one of the world's major producers of bulk Cephalosporins and Penicillin, both for oral use and for injection. It exports its active pharmaceutical ingredients (APIs) all over the world.

It is a leading exporter to the US market as well as to other countries throughout the world. Despite constant and strong competition in emerging markets, ACS Dobfar retains an important share of the global market thanks to strict quality control, investment in Research and Development know-how, human resources and vertical and international integration.

In a recent project, it was approached by a large Japanese company to take on the production of Astaxanthin, a supplement which provides polivitaminic compounds for salmon food, providing colouring for flesh and skin. The approach was made because ACS Dobfar owns one of a few remaining large-scale fermentation plants in Europe and the production of the fish food supplement differed very little from that of traditional pharmaceutical compounds. For the processing solution, ACS Dobfar turned to Rockwell Automation and its PlantPAx process control solution.

Challenge

The company needed a plant-wide system that was practical, reliable and able to interact with all the PLCs on the various pieces of process equipment. It also needed a solution that was modular, flexible and could interface with major networks such as ControlNet, DeviceNet and ModBus, while also offering redundancy and diagnostics.

The fermentation technology remained the same, but the company needed a brand new downstream facility, located in a new building and set a very tight deadline for the installation to be completed. "An additional challenge lay in the fact that this was a new process," explains Renato Donnarumma, Chief Executive of ACS Dobfar's Engineering Department. "With any new process you are faced with peculiarities specific to that process and you have to overcome them. We also had to bring in equipment that differed from our normal plant, including a new filter drier, and we also had to build a new clean room."

The downstream process takes the broth from the fermenter and processes and purifies it. Although it is 'just fish food' it still has to be treated with the same quality considerations as much of the company's existing APIs.

> *"It is a great solution. It is not a DCS, but it is also not a PLC/SCADA solution, instead it offers the best of both worlds."*

Solution

The PlantPAx solution supplied by Rockwell Automation comprised a redundant Allen-Bradley 1756-L63 ControlLogix system, backed up with a redundant HMI Server running FactoryTalk SE (distributed) and clients. The solution included HMI faceplates and ControlLogix add-on instructions. The communication with third-party devices was through Modbus communication cards and HART Analogue I/O cards.

"It is a great solution," Donnarumma explains. "It is not a DCS, but it is also not a PLC/SCADA solution, instead it offers the best of both worlds. One of the huge positives for us is that all of the Rockwell Automation equipment is integrated. Normally, component integration in a plant on this scale is an issue – but not so with the Allen-Bradley equipment – it all talks to each other with very little additional set-up."

Results

"We are extremely happy with the new facility," Donnarumma explains. "The plant is up and running and everything is working as expected. The team from Rockwell Automation was very professional and worked extremely well with our own in-house engineering team."

Rockwell Automation was able to satisfy all of the project's requirements from the outset, while also underlining some aspects that were not required during the planning, but could be implemented without large amounts of cost, time or effort.

"The opportunity to integrate the Process Control System with modules such as Batch is not the only opportunity created by Rockwell Automation," Donnarumma explains. "We also liked the simplicity with which the new process system at the brand new plant will interact with future DCS-type solutions, based on Rockwell Automation equipment. Indeed, at this moment, a second Rockwell Automation-based DCS is currently under approval."

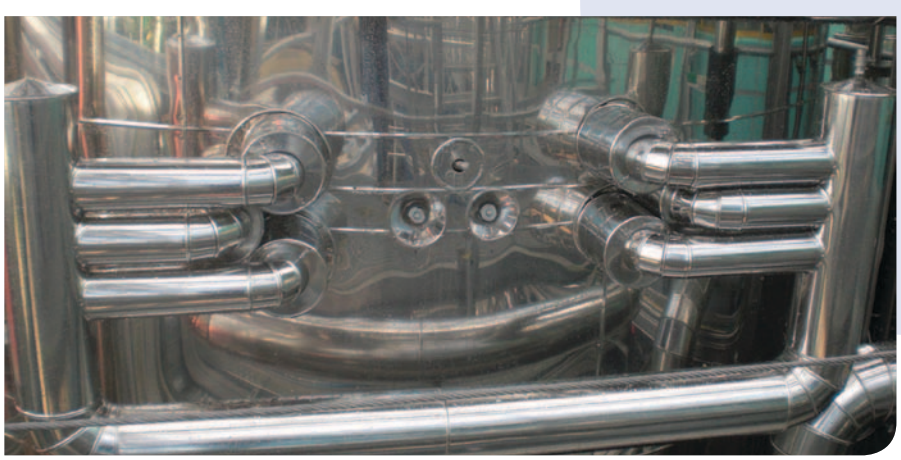
"The team from Rockwell Automation was very professional and worked extremely well with our own in-house engineering team."

ACS Dobfar also took advantage of local system integrators, who were directly managed by a Rockwell Automation project manager. Having assistance near the site and for the engineering team working at the plant in Anagni, represented a great advantage; which also fostered a stronger relationship and more effective communication.

Rockwell Automation's Global Solutions managed and co-ordinated all the activities for the entire life cycle of the project. The project management was focused mainly on: **Engineering and Integration of the Electrical Panel Board** installed at ACS Dobfar, undertaken by the service and support team and a local Italian Panel Builder, and **Engineering Training and Support** for the software, HMI and Control System (ControlLogix), undertaken with the local System Integrator.

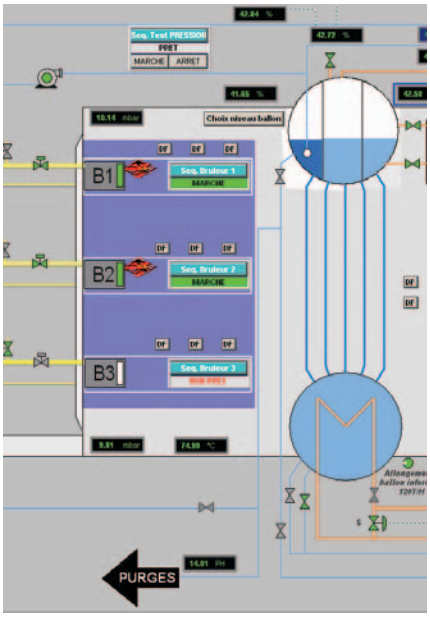
The Global Solutions Team also managed the collaboration between ACS Dobfar's project manager, Eng. Giuseppe Frisenna, who spent a lot of time and effort giving the best information to all the stakeholders of the project, and the System Integrator; focusing on minimising risks and obtaining the best results in terms of process performance and challenging time schedules. The support also given by Rockwell Automation's Service and Support team to the Global Solutions team was also highlighted, in terms of field technical expertise and knowledge of the Factory Acceptance Test (FAT), done at the panel builder, together with the customer and System Integrator.

For more information, e-mail us at:
info_at@ra.rockwell.com
with ref: ACS Dobfar



Tereos Sugar: intelligent and sustainable refining using PlantPAx Process Automation System

Leading sugar producer replaces legacy DCS with PlantPAx to obtain and integrate boiler control for vital operations.



Solution

PlantPAx Process Automation System

- The solution, based on the Logix Control Platform with ControlLogix PAC, replaced an outdated DCS and provides a flexible process control system with excellent reliability
- New I/O platform eases system upgrades
- Services and support
- Turnkey project approach managed by Global Solutions team

Benefits

- Boiler control has been improved, in particular in terms of monitoring reheating; it has been possible to link the boilers together, and power matching is now carried out automatically; boiler operation has excellent reliability
- The boiler control and command system is now totally integrated with the other factory units, allowing traceability to be centralised for the entire production site

The agro-industrial group Tereos, which specialises in the primary processing of sugar beet, sugar cane and cereals, has enjoyed a trusted working relationship with Rockwell Automation for more than ten years, whose products it uses for process automation on some of its production sites. It chose the PlantPAx process automation system to govern the boilers that supply energy to its Boiry Sainte Rictrude production site.

Background

Tereos France is a leading company in the French sugar industry with nine sugar factories, five distilleries and four packaging facilities, producing an annual total of 1.5 million tonnes of sugar and 500,000 cubic metres of alcohol and bioethanol from beet.

Each year the Tereos Boiry Sainte Rictrude sugar factory, located near Arras (in the region of Pas de Calais), produces 250,000 tonnes of white sugar for manufacturers in the agro-industrial sector (drinks, chocolate, jam, biscuit and dairy product manufacturers). This sugar is produced over a very short period, known as the 'sugar campaign', which runs from mid-September to December each year, during which time the sugar beet is harvested and transported to the sugar factory for processing.

Every day during the campaign, Boiry processes 20,000 tonnes of beet, produces 2,800 tonnes of sugar and consumes 15MW of electricity! The sugar factory produces this energy itself, by means of two boilers that supply a turbo-generator with steam. The factory is connected to the national electricity grid (EDF) only at start-up and outside the campaign period.

These boilers are the very lifeline of the sugar factory, and can produce up to 140 and 120 tonnes of steam per hour respectively. 85% of this steam is used to produce electricity; the remaining 15% is used for the various processes in the manufacture of sugar. In 2009, Tereos decided to replace the now obsolete distributed control system which governed the two boilers.

Tereos' objective: to modernise and optimise control of these boilers and integrate these within a single control and command system for the whole factory. The company contacted a number of suppliers and, after examining the proposals, chose to migrate command of the boilers to the Rockwell Automation PlantPAx system.

Challenge

The decision was taken in March 2009…with the sugar campaign due to start in September! This presented quite a challenge for Rockwell Automation, since the factory cannot operate without a boiler. Furthermore, boiler control requires very specific expertise: highly complex regulation algorithms, fine tuning of the burners and extremely sophisticated calculations to anticipate load demand.

Solution

Helping to ensure that this migration took place with minimal risk and within the deadline therefore required specific and diverse skills. This is where Rockwell Automation Global Solutions came in. Its specific knowledge of boiler management and experience in risk management were indispensable in this situation. The Rockwell Automation Global Solutions team carried out a retrospective analysis of the legacy system and defined a migration solution that was able to provide optimal boiler operation with minimal risk.

This solution centres around the PlantPAx process automation system, based on three redundant Allen-Bradley ControlLogix PACs and completely integrated into the factory's overall system. The boiler management specialists from Rockwell Automation adjusted the settings and sequential automation processes that were necessary for control and command of the combustion.

At the end of August 2009, just before the campaign was to start, the factory conducted a week-long 'dry run', during which teams from the sugar factory and Rockwell Automation carried out adjustments and tested the loads. The final adjustments of the system could be made only at production start-up, and there was no room for error.

The first day of the campaign went without a hitch, and the increase in power was as predicted. Michel Hennebique, Manager of Electricity & Automation at the Boiry sugar factory gave his confirmation: "The start-up and commissioning of the boiler under Rockwell Automation went very well; in under two days all the adjustments had been made. And there wasn't a single stoppage throughout the entire campaign."

Results

With two sugar campaigns now completed, Tereos is in a position to benefit from the improvements generated by the Rockwell Automation solution. And the Rockwell Automation Global Solutions team with the PlantPAx system has proved its ability to replace the conventional DCS solution as well as its competitiveness as a solution of this type.

"Boiler control has been improved, in particular in terms of monitoring reheating; boiler output now reaches 96%. Boiler operation is also much more reliable than before. With the Rockwell Automation solution it has also been possible to link the boilers together and power matching is now carried out automatically by the PlantPAx system. The skill and unfailing support from the Rockwell Automation team throughout the project made all the difference", states the Boiry Electricity & Automation Manager.

The boiler control and command system is now totally integrated with the other factory units, allowing traceability to be centralised for the entire production site: alarms, operator actions and process history.

"We took advantage of this migration to carry out a review of the ergonomics of our supervision workstations with Rockwell Automation, and our operators particularly appreciate the increased user-friendliness of the PlantPAx system," added the Boiry Automation team.

Most manufacturing procedures at the Boiry Sainte Rictrude sugar factory – diffusion, purification, crystallisation – are now automated using the solution from Rockwell Automation. Two workshops (washing and filtration) will also be controlled by Rockwell Automation as from 2012. The sugar factory constitutes a benchmark site for the Tereos Group.

But Hennebique does not intend to stop there. He already has plans for the implementation of specific Rockwell Automation software to make savings on his energy consumption, and for the use of FactoryTalk AssetCentre – traceability software to monitor all the modifications carried out in the sugar factory's operational processes.

For more information, e-mail us at:
info_at@ra.rockwell.com
with ref: Tereos

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