



PROJECT CERTAINTY

You have heard the stories — or you have told them yourself — about capital projects burdened by startup delays and excessive costs. Decades-old project methods are not helping anymore.

Today, successful integrated project execution—whether a greenfield new build, a modernization, or a migration—requires all of us to go beyond traditional thinking.

Emerson's Project Certainty approach provides a path to better project results by eliminating cost, accommodating late changes, and reducing complexity. The following stories should make it easy

to envision your own future project savings and successes.



Expert Partnering

Early and ongoing collaboration with experts develops a project vision that drives organizational consensus. Each key stakeholder moves forward feeling project ownership, a commitment to goals, and a project strategy that will help meet those goals.

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Accommodate Change

Project changes are inevitable and frustrating. For example, when an I/O design change is requested a week before system configuration, what is the impact? With the right strategy, you can absorb these changes — and many others — without impacting the schedule.

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Reduce Complexity

Complexity among suppliers and technologies drags down progress. But by eliminating bottlenecks you promote concurrent work streams. And similarly, innovative project management technologies mean reduced complexity in data and documentation.

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Eliminate Cost

Innovative engineering practices and design eliminate costs associated with hardware, the labor to install it, and the effort to maintain it.

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Expert Partnering

Innovative and experienced partners brought to a project early, such as in the FEED stage, can put measures in place to drive strategic alignment. By setting the project requirements early, *application expertise and local and global engineering teams all work toward project execution and operations goals.*

Working closely with Emerson, Boliden achieved a 20% increase in production without missing any project deadlines.



Learn more about Project Certainty.



Chemical Manufacturing (Europe)



Team Chemistry and Expertise Overcome Complexity

Time to Update

A European chemical company knew its existing control system was being phased out. After working productively with the Emerson team, management saw the benefit of migrating to Emerson's DeltaV™ distributed control system (DCS).

The facility employs a complex batch process to manufacture plastic additives used in products such as PVC. To maintain production, timing of the cutover and DCS migration was critical.

As the project team began considering how to reverse engineer the system design and migrate, they were up against a very tight 15-month project schedule and a shutdown period of 2.5 weeks for installation, SAT, and start-up. They also needed to redesign the batch implementation to be ISA-S88 compliant.

Emerson's expertise made the project less complex and met the goal of an optimized batch strategy.

Familiarity Breeds Ease

Thanks to past successes and good chemistry between the two project teams, Emerson was the organization's choice to partner with in this migration. Management trusted Emerson to use its expertise to assist in taming the project complexity and in optimizing the batch strategy.

The project would include full configuration standardization with DCS reverse engineering, configuration, virtual FAT, start-up and commissioning, plus using DeltaV Batch Analytics for process optimization for recipes and transitions.

Local and Remote Expertise

The Emerson engineering work cell, fully dedicated to the project, based enhancements of the complex batch recipes on the Emerson standards library to streamline the work and assure the use of best practices. Expertise combined with the library delivered a complex batch design that complied with S88.

Because the facility and Emerson teams had to work tightly together, they needed a way to share files and communicate effectively. Reducing the complexity of communication, Emerson's Remote Virtual Office (RVO) collaboration platform provided secure, reliable, distributed engineering of automation projects on a common infrastructure that reduced overall project schedule, cost, and risk. Project stakeholders from both companies could look at the configuration — facilitating adoption and reducing training.

The RVO environment was also used to complete a virtual FAT. The project team was able to stay at the plant and continue to manage production during the FAT. The results included reduced travel, expert Emerson guidance, and less time away from the operating plant for personnel. Testing was completed in segments; while Emerson was working on the next segment of configuration, plant personnel were testing the completed configuration. This helped ensure consistency and maintained the pace of progress.

Expert partnering and teamwork delivered the successful project on time.



Learn more about Project Certainty.



Expertise Helps Accommodate Late Process Changes

A Well-Used Smelter Seeks New Strength

The smelter in Odda, Norway has been in operation since the 1920s. Boliden, the current owner, now employs the smelter to supply Europe's steel industry with zinc. Always on the lookout for improvements for their customers, Boliden planned to reduce process bottlenecks and increase automation flexibility in their operations through a project named P200.

Maneuverability, accuracy, and planning experience were required to execute the automation and process improvements no matter the level of changes throughout the project. For the sake of customers and profits, extending the project beyond the schedule was not an acceptable option.

A Migration, an Upgrade, and a Boost in Output

Boliden was bold in their goals. Their choice of automation partner, Emerson, had to be just as bold in their execution. Immediately, Emerson gathered local and global resources to optimize the project execution strategy; the Emerson work cell was dedicated DeltaV™ distributed control system (DCS) migration: An outdated, non-Emerson control system was controlling many smelter areas, including the most critical—the roaster. Because that control system was leading to waste, Boliden scheduled a migration to the DeltaV DCS during a planned maintenance stop. Roaster migration had to be complete in ten days. DeltaV CHARMs helped accommodate all I/O changes and were installed in existing DCS cabinets. Software testing was performed upfront.

Upgrade to latest DCS software: Meanwhile in the leaching plant, an existing DeltaV DCS was operated from one large control room with many smaller remote control rooms. The network was

complex. Boliden requested Emerson to complete the upgrade to the new DeltaV software version in a short eight-hour stop to the plant—including system shutdown, hardware swapping, and software adjustments. No problem. The dedicated Emerson work cell upgraded the full system and swapped 4500 I/O in two and a half hours.

Expand automation to boost production: As automation was added to manual areas of the facility, Boliden optimized the plant design through advances in techniques and technologies.

"With three projects as complex as these, missed deadlines could have happened, but neither Emerson nor Boliden Odda would let that happen."

- Sverre Strand, Boliden

Ready for Another Hundred Years

Overall, a combination of local project execution, global support, and close partnership between Emerson and Boliden produced success and met the schedule deadlines. Thanks to improvements implemented across the facility in many systems and processes, Boliden increased Zinc production from 160 thousand tons to 200 thousand tons—a 20 percent increase in production.



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Reduce Complexity During and After Project Execution

Profits on a Razor's Edge

Accuracy and speed matter in a liquefied petroleum gas (LPG) terminal — an environment of razor-thin margins. Because LPG prices can move quickly up or down, terminal operating companies recognize their profits depend in part on the company's ability to move product through the terminal efficiently to meet changing customer needs.

Seeing increases in global energy usage and geographic imbalances between production and consumption, an LPG terminal decided it was time for an update. They set priority on reliability of the end process, the movement of data and product, and the project automation team with whom they would partner.

Improvements on the Horizon

The organization knew they could improve operations by fully replacing the old locally built control system. They also wanted real-time delivery data for their customers while optimizing lines to create more efficient transfer operations for ship, truck, and rail terminals.

Complicated, yes.

Expertise and the Remote Virtual Office Reduced Project Complexity

As the project started, a dedicated Emerson team partnered with the LPG team to discuss goals for the enterprise and for the project execution. Relationship and understanding the terminal business model were important. A high-speed terminal such as this must avoid shutdowns, so communication, expertise, and planning were vital to prepare the team to respond to project issues and keep the terminal online as much as possible.

Emerson's project execution strengths enabled execution with high confidence of success. Emerson's local presence and global capacity meant a large group of commissioning resources were available at the right times to work in shifts. Resource flexibility allowed the schedule to be met.



In addition to preparing the team to engineer, operate, and maintain the control system, RVO sped up the project by removing complications in FAT and implementation.

The global project team benefitted from Emerson's Remote Virtual Office (RVO) — a dedicated, secure engineering environment accessible by Emerson and its customers. Using RVO, operators, maintenance, and technical personnel (locally and at company headquarters) could participate in the project. In addition to preparing the team to engineer, operate, and maintain the control system, RVO sped up the project by removing complications in FAT and implementation.

After 33,000 project execution hours spanning just nine months and a 1.5-week shutdown, the LPG's routings are safe. And the organization can satisfy customers with real-time data and an optimized process. Thanks to expertise and partnership.

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Oil & Gas

Collaborating for Success

Setting the Bar High

When an oil and gas company began developing a new offshore platform, the organization had a very specific list of needs for a project partner.

The company was looking for a partner that could meet its preselection criteria to ensure the expertise necessary to help complete the project on time and on budget. It was essential that any partner already have a history with the organization, show significant technical and execution differentiation, and have a local presence for sales and service.

By selecting a company that would meet its global standards, management set the project up for success from the very beginning.

The Benefits of Partnership

Management wanted the platform delivered on time. Absolutely no delays were acceptable on the project, as each day past the first oil target meant millions of dollars in lost revenue. The organization looked to Emerson as a strategic partner.

Through numerous previous projects with the company, Emerson had customized its Project Management Office (PMO) to create a customized toolkit. Using this toolkit, the implementation team was able to get a jump-start on developing documentation in support of the FEED stage, allowing the company to reuse nearly 70% of project documentation from previous projects.

The platform design had substantial weight and space restrictions. Any added equipment was scrutinized to the inch and ounce, yet I/O was numerous and complicated. The company selected Emerson's DeltaV™ Electronic Marshalling with CHARMs technology and field-mounted junction boxes, as they were the only equipment on the market that could satisfy the platform's constraints.

In addition, Emerson had already done work in the field where the

Field wiring flexibility that the team built into its system accommodated late receipt of essential EPC data, with the changes having no impact on meeting the first oil deadline.

platform would be located. The organization valued the sales and service office that had been established in the vicinity, as it meant immediate access to a wide range of subject matter experts.



Proven Partners Mean Proven Results

By choosing to work with an expert partner in its project, the organization gained the ability to delay decisions far into the process. In one instance, the implementation team received essential data from an EPC four months behind the agreed project schedule. However, the field wiring flexibility built into the system accommodated this, with the changes having no impact on meeting the first oil deadline.

Beyond reduction of schedule risk, management's decision gave the organization flexibility in project execution. Getting a jump start on the development process provided a clearer idea of what things would work and what ideas needed to be adjusted. Field wiring flexibility provided the means to make the necessary adjustments, even late in the project.

Altogether, the organization estimates that its expert partnering choice saved the company a minimum of \$10 million over the course of the project. But even more importantly, key project choices allowed the company to develop a state-of-the-art offshore platform that meets each and every one of its critical requirements.



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Life Sciences (Europe)

Delivering Relief to Patients

Lives Depend on the Results

A European pharmaceutical company initiated a project to bring online a new biopharmaceutical production center. This fast-track project had to be completed—from design to production—within two years.

Engineers designed the bioplant manufacturing operation to include upstream and downstream processes in addition to all the supporting processes for media, buffers, and utilities. Managing and documenting the automatic and manual activities involved in production would require strong integration between the manufacturing execution system (MES) and distributed control system (DCS) so that a single batch record could be delivered for each complex batch run, and so that engineers could design recipes in one system rather than in multiple.

Bringing all the data and systems together efficiently would require assistance from an expert partner not only with experience in the biopharma industry, but with strong success in integrating biopharma systems.

Multiple Systems, Multiple Teams Working as One

The company turned to Emerson for expertise and solutions in part thanks to Emerson's Life Sciences Industry group and their strong track record in implementing comprehensive DCS and MES solutions in similar conditions with similar requirements. Emerson's local project leadership integrated resources using common processes and tools. Emerson expertise included additional global engineering teams in Europe and India to meet the requirements of a complex fast-track project.

Key also was the fact that Emerson's Syncade manufacturing

execution system and DeltaV™ DCS could be seamlessly integrated. Seamless integration enabled the project team to shape and use the two systems as if they were one—spending less time building, implementing, and (later) maintaining the systems and the documentation. Not only did the solution reduce complexity through its native integration, but it enabled the project team to absorb last-minute changes. The customer's project team saved engineering time because batch design is performed in just one system.



Not only did the solution reduce complexity, but it enabled the project team to absorb last-minute changes because the two systems were well and seamlessly interfaced.

Success

The team completed the project in the required timeframe and the medications were introduced to patients soon after.



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Accommodate Change

Underestimating task times due to insufficient, inaccurate, or late data causes late change orders, rework, and multiple schedule extensions. But manufacturers around the world have found Emerson solutions not only accommodate change, they *add speed and flexibility, while reducing project risk and ensuring a better start up.*

Choosing Junction Boxes mounted in the field enabled Seplat to save in labor costs, documentation, and cabinet design time—a savings of \$1.4M.



Learn more about Project Certainty.



Accommodating Change in Rough Seas

Begin by Navigation through a Difficult Market

In the turbulent North Sea, Statoil planned to erect a fixed platform that would extract 60K barrels of oil per day from the Norwegian continental shelf. Global market conditions at the time tightly squeezed the margins of oil and gas operations and significantly constrained costs. To succeed, the project would need to include contributions from multiple international teams and hardware components from several remote manufacturing locations.

Though Statoil recognized that execution complexity would be high and project changes numerous, they also knew production had to start as soon as safely possible. Project changes must be completed accurately. And the evolving project must meet deadlines.

Lay Solid Solution Groundwork

To ensure profitability in the tough market, goals included project efficiency as well as long-term operational and maintenance savings. Statoil turned to Emerson for a fully remote, integrated DeltaV™ distributed control system (DCS) and DeltaV safety instrumented system (SIS). Attractive also was the potential for maintenance and operational savings with 200 wireless Rosemount pressure and temperature devices as well as AMS vibration monitoring capabilities.

To create efficient communication among global groups — accelerating design, testing, and commissioning — Statoil chose

By decoupling hardware and software, the project team could put I/O hardware in place well before design completion.

Emerson's Remote Virtual Office (RVO). With RVO, the team could access project resources and expertise regardless of location and could reduce travel time.

Preventing Unplanned Changes from Risking Strategic Successes



Even with everything in place and high-quality vendors working around the globe, the project team experienced interruptions that could have risked derailing automation success.

For instance, control I/O hardware was required before design was final. Without DeltaV Electronic Marshalling with CHARMs technology, that condition might have caused delays. Instead, the project team created and delivered I/O hardware in standardized junction boxes without finalized software.

In addition, because Statoil had chosen wireless devices, any placement changes could be made quickly, and the plan reduced wiring by 9200 meters.

To make up time from delays outside the automation area, the project team used AMS Device Manager bulk transfer for commissioning. In fact, commissioning multiple devices at once saved about two hours per device.

Factory Acceptance Testing (FAT) was performed safely, confidently, and virtually; running all the normal tests without any control or I/O hardware. Emerson's virtual FAT mobilized resources around the world and was complete in only two days with no hardware shipping or rigging.

Statoil and Emerson personnel stationed around the world built a streamlined team to align purposes, overcome cultural differences, and apply technology to succeed through difficult conditions.

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Kuwait Oil Company (Oil & Gas, Kuwait)



When Change is the Only Constant

“Emerson and their local LBP made it possible for us to make continual project improvements without threatening our schedule.”

- Kuwait Oil Company

Battling a Cumbbersome, Complicated System

When the Kuwait Oil Company (KOC) took over the EPF-50 sour field gas and crude plant in northern Kuwait, the organization found that significant changes were necessary if the company wanted to continue its expansion. The programmable logic control (PLC) system installed in the field, with approximately 3,500 SIS signals (overall 6,000 I/O's equipped), needed to be replaced due to non-segregation of ESD, DCS, F&G, and HIPPS, as well as non-availability of spares for future expansion.

With existing PLC hardware spread throughout the field, management of the upgrade had to be handled very carefully. The risk of unexpected changes during project implementation was high due to the high number of I/O points KOC had to accommodate.

KOC needed an upgrade plan that would protect the organization from cost and schedule overruns due to late-project changes common to complex overhauls.

Complicated Projects Bring Many Changes

Seeking to meet KOC's desire for flexibility in mid-project change

requests, Emerson's local business partner, Almeer Technical Services, recommended DeltaV™ Electronic Marshalling with CHARMS technology. Confidence in Emerson and Almeer from KOC's top management led to the implementation of Almeer's recommendations. As old PLC hardware was removed from the field, the temporary control room was demolished and replaced with a permanent control center. The flexibility of CHARMS I/O allowed the upgrade team to incorporate all field devices into the new control system without concern for signal type, preventing I/O issues from causing delays. Electronic Marshalling made it possible for all changes, including ones that happened after systems were installed, to be accommodated without cost or schedule overruns common in large-scale capital projects.



Stay Flexible, Stay on Target

KOC's implementation team was able to reduce marshalling cabinet footprint and significantly limit cross-wiring and running new cabling, allowing them to make changes on the fly. Having the flexibility to make these changes saved money and time. In addition, the ability to make changes to engineering while the plant overhaul was in progress has helped the organization to build a system prepared for future expansion.

By working with an experienced, flexible local partner, KOC made key choices that allowed for changes on-the-fly, avoiding extra costs and the risk of running behind schedule.

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Seplat Petroleum Development Company (Oil & Gas, Nigeria)

Big Savings Thanks to a Change in Plans

An Opportunity for Greater Business

Conditions crystalized for Nigeria's Seplat Petroleum Development Company to fill a growing demand for gas to power via the nation's power grid. Design, fabrication, shipping, installation, and commissioning a new 150MMscfd gas plant – complete with preparations for three additional trains to be added as 'plug and play' – was completed in 18 months. A final shutdown of ten days enabled the new and the existing plants to be integrated to form a single plant.

In that short week and a half, many activities had to be accomplished, including tie in, test, and commission of more than 700 I/O for both the distributed control system (DCS) and the safety instrumented system (SIS). All went smoothly and Seplat could set production at maximum from day one.

Placing field-mounted junction boxes enabled Seplat to work in the bad weather season and realize huge savings on labor, documentation, and cabinet design time. The result was a CAPEX savings of \$1.4M plus lowered construction and risk.

Seasonal Flooding Delays Construction

Seplat knew well that the rainy season leads to high ground water which limits the ability to construct buried services such as cables, typical to a traditionally designed plant. To avoid that issue in the future, Seplat chose Emerson's DeltaV™ DCS, Electronic Marshalling with CHARMs technology, and its field I/O solution, which eliminates long "home run" multicore cables.

In this solution, short runs of multicore cables from field devices are connected to CHARMs housed in field-mounted junction

boxes. Fiber optic cable connects the junction boxes to the control room. The project team replaced 265 multicore cables with four fiber optic cables.

Placing junction boxes – preconfigured and certified for zones 1 and 2 – mounted in the field meant that Seplat no longer needed to construct a field auxiliary building that would typically house and protect the I/O system hardware. Expected footprint requirements, labor costs, documentation, and cabinet design time evaporated to produce a savings of \$1.4M, but more critical to Seplat were the enormous savings on schedule and construction risk.

Accommodating Change and an On-Time Finish

Another advance made possible by Electronic Marshalling with CHARMs technology is the flexibility to leave I/O undefined until closer to DCS start-up. By separating the I/O subsystem design from the control strategy design, the CHARMs I/O Card allows the field instrumentation design to begin long before the control strategy is finalized. Because CHARMs enabled the project team to accommodate design changes late in the project, I/O signals could be modified without expensive change orders and negative schedule impact.

The plant was commissioned in less than ten days and has been running for over twelve months with no major issues. The on-time finish and great project cost savings testifies to the certain success of this project and contributions of DeltaV and CHARMs.



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A Successful Partnership

Large-Scale Coordination

When an energy company began a deep water development, the organization knew that the project would be complex. The topsides, hull, and subsea elements of the development all had very different design requirements, yet would need to be connected with a standardized integrated control and safety system (ICSS).

Management knew the complex project would require a committed partner that could ensure global coordination, keep multiple EPCs and OEMs on the same page, and streamline the modifications of I/O design, package philosophy, and safety philosophy.

The organization selected Emerson as its ICSS supplier early in the FEED stage in order to standardize its ICSS and all third-party PLCs for all levels of the project. By selecting an integrated team with global expertise, and including them from the earliest FEED stages, the company took the first step to ensure project success.

Success in Partnership

Working with multiple EPCs was necessary, but also increased risk.

To avoid integration issues that could delay first oil, the company involved the same Emerson integrated project management team on all three main contracts: hull, topsides, and subsea. By using the same team of engineers in development of the core operating sections of the platform, the organization was able to provide continuity and standardization across the different elements of the project.

Because Emerson had core experience with the organization's upstream projects from FEED to startup, the integrated project management team was able to establish critical technology direction in order to deliver a DeltaV™ distributed control system (DCS) integrating with all levels of the platform. The team created standardized template libraries to be used by all three EPCs, ensuring that template design by the topsides EPC didn't cause delays with the other EPC schedules.

The project management team gained peace of mind, as its partnership provided access to Emerson's 24/7 commissioning, startup, and spares support, ensuring that unexpected changes and project speedbumps would not stand in the way of on-time project completion.

Working with Emerson, the implementation team developed a global network management plan, creating strict guidelines for network addressing to prevent overlap that would lead to network communication issues. In addition, design validation tests helped ensure that any third-party vendor design was validated in advance, avoiding significant rework during commissioning.

Teaming up to Deliver Results

Taking advantage of an expert partner able to leverage global processes and tools delivered many key benefits. By planning ahead, the organization was able to create a clear set of guidelines and templates to keep all of the pieces of the project working together smoothly. Standardization decisions made early helped the implementation team avoid costly late-stage changes to the project. Most importantly, the project team was able to optimize its execution strategy to deliver the deep water development ahead of the planned start-up date.



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Reduce Complexity

Today's automation projects involve multiple stakeholders, engineering contractors, and suppliers. Automation systems and field technologies can add frustrating roadblocks. But methods exist today to break through the blocks — **teams can achieve full project success working together.**

Thorough documentation planning led by Emerson saves significant time during I/O migration.



Learn more about Project Certainty.



Chemical Manufacturing (Europe)



Empowering Operators

One Critical Decision can Lead to Many Benefits

A European chemical manufacturer had been operating with a legacy control system, that no longer met the company's evolving needs. The control system did not have the necessary features to allow the organization to follow its new philosophy of putting operators back in charge of production, helping them better understand the processes they run.

Management knew that truly reducing complexity of operations would empower operators to be engaged decision makers, but they only had a 14-month window from design to delivery.

Doing More while Saving Time

Using Emerson's Remote Virtual Office (RVO), team members were able to connect to each other and to technology experts around the globe. More than 20 worldwide project team members could communicate and contribute remotely through cloud engineering and virtual factory acceptance testing (FAT). This environment not only saved on travel time and expense, but also allowed the implementation team to perform FAT while simultaneously redesigning process sequences to put operators back in control of production.

Throughout the project, global contributors were able to keep a close eye on each engineering step, ensuring that the new system would deliver all the features the organization needed while still streamlining and simplifying the human-machine interface the operators would rely on.

The company chose to implement Emerson's DeltaV™ distributed control system (DCS) with Electronic Marshalling to simplify conversion in the field, and to provide operators the full-

With operators fully trained on plant startup before commissioning, the commissioning period was reduced to 4 weeks for a project with over 4,000 I/O points.



featured toolset they needed. The organization moved to a decentralized structure, doing away with the auxiliary room and implementing Electronic Marshalling with CHARMS technology in field shelters, speeding up implementation by allowing the transition team to avoid concern for I/O signal types.

Finding Solutions through Simplification

The migration solution that management chose allowed the organization to simplify both the turnaround process and overall operations at the plant. The transition team not only managed to complete the entire project in its 14 month window, but also managed to see higher output, more reliability, and lower costs.

Moreover, making smart choices that accelerated implementation allowed the team to ensure that operators were fully prepared for the transition. Operator training coupled with HMI improvements reduced control system complexity, with the result that control room staffing was reduced from 2 operators per room to 1.5, freeing operator hours for other important plant tasks.

In any project, critical decisions made early can have significant impact on success. By streamlining project management and simplifying implementation in the field, the organization was able to implement its operator-centric DCS without running over time.

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Chemical Manufacturing (U.S.)

The Season for a Less Costly, Less Complex Expansion Project

Planning for Growth

To meet their customers' needs for seasonal agricultural fertilizers, a chemical manufacturer in the United States had to be ready for the growing season. They planned for a facility expansion to supply agricultural fertilizers, and if start-up was delayed by complications or costs, the company would miss the season, miss opportunities, and miss profits.

Commissioning Saves Time and Money

As the company began planning their automation solution, they recognized the success they had at other facilities using Emerson's DeltaV™ distributed control system (DCS) and AMS asset management software. Emerson's user-friendly and robust solution was a natural choice for their current project.

Commissioning went much faster and easier than anticipated thanks to Smart Commissioning. Before the new AMS Device Manager bulk commissioning, the company used to commission devices manually – one at a time for hundreds of devices. Multiple employees used to be paid overtime to complete commissioning on time.

In the current project, however, HART devices were automatically sensed with AMS Device Manager through the DeltaV DCS. Then,

Success was driven by cost savings and simplification made possible by Emerson and AMS Device Manager bulk commissioning.

using AMS Device Manager bulk transfer, an implementation team defined configurations for devices via templates based on existing devices. Configurations were defined once and were used many times on devices throughout the expanded facility, driving ease and consistency in the process.

For loop checking, the combination of the DeltaV DCS and AMS Device Manager meant that a single technician at a control room workstation executed loop checks – without another technician working in parallel in the field. The system automatically documented all the steps and saved reporting time.

Time Enough for Unexpected Extra Production

With their new capabilities, the organization completed activities in one day that previously would have required a week. Ultimately, commissioning was completed ahead of schedule with no project overruns. Project resources could then be allocated to other tasks on the project.



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Mahou-San Miguel (Food & Beverage, Spain)



Maintaining a Legacy

Ensuring On-Time Delivery

Mahou-San Miguel needed to modernize the control system it used for reliable operation of its largest factory to face the challenges of Industry 4.0. The brewery, the second largest in Europe, was essential to the delivery of the top-quality beers customers had come to expect from Mahou-San Miguel for the last 125 years.

Prior to the control system change, Mahou-San Miguel had to invent various complicated methods to share data, making it difficult to trace maintenance issues throughout the software and to monitor and solve production issues quickly. The organization wanted a control system that would be open for the easy exchange of data with other systems.

Though Mahou-San Miguel knew it needed a change, the company could not afford an extended outage that would disappoint loyal customers. Over the entire three-phase, 5-year project, the organization would have only a single shutdown window of one week. All other programmed shutdowns would occur in phases during weekends.

Make it Simple

Mahou-San Miguel selected Emerson after an in-depth study of the state-of-the-art in automation technologies. Emerson's expert knowledge and DeltaV™ distributed control system (DCS) with Electronic Marshalling and CHARMs technology, would allow the company to plan a complicated control system migration, and deliver it without extended production upset.

Implementing DeltaV and wireless communication allowed Mahou-San Miguel to introduce flexibility into the installation of the brewery's control system. Electronic marshalling simplified the configuration of I/O enclosures and prevented I/O problems from causing delays and extending the planned shutdown window of the plant.

Emerson wireless technologies enabled the commissioning and start-up of valve nodes in the field, rather than in the control room, saving significant commissioning time, and allowing Mahou-San Miguel to maintain its short downtime window.



"By taking advantage of expert knowledge and key technology, we were able to shorten our stoppage window significantly. This meant we could deliver the upgrades we needed without disappointing our customers."

- Santiago España, Industrial Automation Systems Manager,
Mahou-San Miguel

Quality Results

Because Mahou-San Miguel couldn't afford to extend its shutdown or project deadlines, the plant's upgrade project had to be done right the first time. A great deal of effort and resources were devoted to FAT testing, resulting in success.

By creating a detailed and personalized FAT procedure focused on critical functions, and working with Emerson control systems specialists and Mahou-San Miguel process specialists, the organization completed its migration project within its short shutdown window, in three different phases, without changes in the budget or schedule.

A satisfied project schedule and no risk of product shortage ensured that there would be only satisfied customers drinking Mahou-San Miguel in Spain and across the globe.

Learn more about Project Certainty.



Eliminate Cost

Increasing pressures require a more holistic look at project costs. Emerson's innovative services and technologies find methods that reduce more than just equipment cost, they eliminate work, improve efficiency, and right-size engineer to reduce cost. *In the end, your project risk shrinks, as do overruns and lost revenue.*

Southern States cut construction and wiring costs by 40% over what they would have been with traditional marshalling cabinets.



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Samsung Biologics (Pharmaceutical, South Korea)

Opportunity Becomes Value

Samsung Builds for Flexibility and Quality

Large pharmaceutical companies face manufacturing challenges due to the difficulty in scaling production to adapt to changes in product demand. Understanding those challenges, Samsung Biologics designed a facility that would provide their contract manufacturing customers flexible, reliable, one-stop services for process development, quality control, and production manufacturing at reduced price, while maintaining high quality and regulatory compliance.

Because Samsung needed to take advantage of market conditions, the project schedule from system design to startup was very tight. As they considered automation partners, Samsung valued Emerson's global project references, execution organization, and capability in Korea, Asia Pacific, and globally. Samsung recognized the opportunity to benefit from the DeltaV™ distributed control system (DCS) and flexible DeltaV technology such as CHARMs.

Solution in the Field and in the I/O

Emerson and Samsung saved project time and costs by implementing strategic technologies. In fact, by choosing DeltaV Electronic Marshalling with CHARMs technology, and configure-to-order I/O enclosures, the team reduced the project schedule and the cost consequences resulting from late I/O changes at the site.

- Installation of field-mounted I/O enclosures: Wherever possible, Samsung standardized on a specific I/O field enclosure design to reduce engineering and installation work. Additional savings came from reduced wiring required to connect junction boxes to devices.
- Reduction in loop check and commissioning: Only one person (rather than two) per instrument was needed to perform this task, thus saving schedule time and labor cost.

- Reduction in late changes to wiring: For any late changes in I/O design, CHARMs simplified reassigning I/O, Electronic Marshalling meant less rewiring and conduit, and field enclosures reduced the cost to run changes to the control system.
- Reduced FAT time: Samsung successfully used a phased approach for the FAT. Hardware and software testing was performed separately as the engineering personnel were available, then the tested elements were delivered as the site became available.



“Our Emerson solution – completed under budget and within the schedule – fully supports our goal to offer flexible, reliable, one-stop contract manufacturing services.”

– Samsung Project Team

Don't Meet the Budget, Beat it

Overall, the CAPEX savings was approximately \$3M with project schedule reduction totaling about 7800 hours and field installation savings of 6000 hours.

Samsung realized that not only could they meet time and cost goals for the facility start up, but future process operation and changes would meet fluctuating customer demands. Electronic Marshalling and CHARMs have proven to streamline changes and the junction boxes in the field mean lower continued wiring costs.



Learn more about Project Certainty.



The Virtual Solution to Real Cost Reductions

Letting Go of the Legacy

A global Life Sciences company wanted to take advantage of the improved reliability and control possible in newer distributed control systems (DCS). However, the operating system (OS) running the DCS was no longer supported, and the old server hardware wouldn't allow for an OS upgrade.

Because of the high costs of production downtime required to take the DCS completely offline for replacement, the company found itself chained to old software and hardware. They needed an updated solution that would not only deliver the newest version of DeltaV™ distributed control system, but also allow the company to implement future upgrades without concern for hardware requirements.

Downtime means lost revenue. When forced to choose between the systems they want and the uptime they need, many plants simply make do with less. This company found another way.

Unchaining Hardware and Software through Virtualization

The project team chose Emerson's DeltaV Virtualization solution because of the cost savings and opportunity to significantly reduce downtime during migration. The move to virtualization would dramatically reduce the company's hardware footprint, and would decouple hardware and software, allowing the organization to easily perform updates and upgrades in the future. Workstation and server failures would no longer be a concern, as new virtual machines could be easily recreated in minutes, and all management could be performed from a central location. Virtualization would also increase disaster recovery capability and improve availability site-wide.

Eliminating Costs by Eliminating Hardware

By running DeltaV in a virtual environment, The organization was able to eliminate project costs by removing unnecessary hardware. Not only was the company able to save hardware purchasing costs, but the reduced footprint of the control system hardware meant a savings in cabling, power, and cooling, as well as avoidance of the need for a costly data center expansion.

More importantly, virtualization provided the organization with the ability to build a test environment that ran parallel with the legacy DCS equipment, meaning the plant could perform its downtime tasks that required the old control system while the upgrade team implemented the new one. Overall, the virtualization initiative delivered the best of both worlds: avoiding costly investments in data center and hardware expansions while delivering improved performance and reliability.

Workstation and server failures would no longer be a concern, as new virtual machines could be easily recreated in minutes.



Learn more about Project Certainty.



Southern States Chemical (Chemicals, U.S.)



Cutting Costs by Thinking Ahead

Going Green with a Greenfield Plant

Wilmington, N.C.-based Southern States Chemical planned to build a new, state-of-the-art facility on a neighboring site to meet EPA regulations and expand production capacity. In order to do away with manual operations, the organization would also upgrade to an automated system.

As with any large-scale capital project, the greenfield plant needed to be built to the best possible specifications while also keeping down the expense of building a brand new facility. By making some key choices in the early stages of the project, Southern States was able to do just that.

Finding Savings in Flexibility

In the early stages of planning the new plant, Southern States made a key decision. The organization found that it was able to recycle major plant components from a nearby decommissioned government munitions plant. By recycling components, Southern States would be able to save an estimated 20% on the cost of the new facility. However, in order to preserve this cost savings, Southern States needed to ensure that integrating the old equipment (and its variety of I/O types) with newly purchased equipment would not delay startup or increase costs.

In order to keep down costs and risks of integration while not sacrificing on performance, Southern States chose Emerson's

Southern States cut construction and wiring costs by 40% over what they would have been with traditional marshalling cabinets.

DeltaV™ Distributed Control System (DCS) with Electronic Marshalling for its control system needs.

Later in the project, Southern States made another key decision. The organization chose to implement Electronic Marshalling with CHARMs technology, the first of its kind in North America. Adding the flexibility of Electronic Marshalling with CHARMs allowed Southern States Chemical to terminate all plant I/O in 10 junction boxes located around the plant. These junction boxes connected to the control room via two Ethernet cables, significantly decreasing the necessary field wiring.

The flexible I/O of CHARMs offered the additional benefit of allowing late engineering changes. In a number of cases, an I/O point ended up in a different cabinet from the one that was originally planned. Using CHARMs, the implementation team could easily relocate the I/O module without added difficulty or cost.

Translating Choices into Savings

By choosing Emerson's DeltaV, Southern States was able to eliminate a number of project costs. Overall, the project's capital cost savings were significant. Southern States cut construction and wiring costs by 40% over what they would have been with traditional marshalling cabinets. In addition, the organization was able to make a number of late-stage changes to the project without incurring cost overruns.



Learn more about Project Certainty.



Project Certainty



Emerson
North America

1100 W. Louis Henna Blvd.
Round Rock, TX 78681-7430,
United States
🕒 +1 800 833 8314

Latin America

1300 Concord Terrace Suite # 400
Sunrise, Florida 33323,
United States
🕒 +1 954 846 5030
🕒 +1 954 846 512

Europe

Blegistrasse 21
6341 Baar,
Switzerland
🕒 +41 41 768 61 11
🕒 +41 41 761 87 40

Asia/Australia

1 Pandan Crescent
Singapore 128461
🕒 +65 6777 8211
🕒 +65 6777 0947

Middle East/Africa

PO Box 17033
Jebel Ali Free Zone - South 2
Dubai, United Arab Emirates
🕒 +971 4 811 8100
🕒 +971 4 886 5465

🌐 www.emerson.com/en-us/expertise/automation/project-certainty

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