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“Users can literally create new time and space where there was none before.”

What Could YOU Do with I/O on Demand?

Already Deployed at More than 300 Sites around the World, Electronic Marshalling Is Delivering Outsized Benefits for the Process Industries.

With its October 2009 launch of the DeltaV automation system with “I/O on Demand,” Emerson Process Management set out to revolutionize one of process automation’s most onerous and time-consuming activities: the engineering and management of input/output (I/O) subsystems.

I/O on Demand proposes to eliminate broad swaths of time and effort over a process automation system’s lifecycle, to shorten project schedules and minimize system footprint, even while increasing future flexibility. In so doing, I/O on Demand promises to deliver for its users “the greatest degree of flexibility with the least amount of effort

and risk,” Chief Strategic Officer Peter Zornio told *Control* at the time.

After just four years, Electronic Marshalling with CHARMs (characterization modules) technology, the cornerstone of I/O on Demand, already has logged more than a billion hours of operation at 300 sites worldwide. How these users—throughout the process industries and around the globe—are using Electronic Marshalling to deliver previously unthinkable results is the focus of this special report. First up, though, *Control* visits with Claudio Fayad, Emerson marketing director, DeltaV platform, for the big picture view of what’s made Electronic



Marshalling such a game-changer for how automation is done in the process industries.

Q • Electronic Marshalling technology has really taken off since it was first introduced. Why do you think so many users have opted for this approach?

A • The great thing about Electronic Marshalling is that people make their own conclusions about the benefits of the technology very, very quickly. Its ability to compress project engineering schedules has clear advantages in both greenfield plants and in retrofits.

In the first case, reducing time to first production for a manufacturer—or, for example, time to first oil for an energy company—can mean millions of dollars in revenue gained. And in the second case, Electronic Marshalling allows users to reduce or even eliminate the turnaround time associated with

commissioning a new system, again restoring what otherwise would be lost production and revenue. And because of its smaller footprint, the new system can be installed in fewer enclosures—sometimes right alongside the old system in existing enclosures. This both reduces costs and allows even faster switchover to the new system.

With Electronic Marshalling, users can literally create new time and space where there was none before. The sheer amount of benefit is simply that big.

Q • How is it that Electronic Marshalling has eliminated so much time and effort?

A • If you think of the old way of doing things, a project engineer had to have a pretty firm handle on the number and type of I/O points that would be needed before he could start doing his hardware design. Each type of I/O

“Automation is no longer a project bottleneck and is off the critical path.”

— Claudio Fayad,
Marketing Director,
DeltaV Platform,
Emerson Process Management



required its own type of I/O card, typically in groups of eight. Further limiting system flexibility, each I/O card was tied to its respective controller. And when those inevitable late changes in process design trickled through, he may or may not have allowed for an appropriate number of the right type of I/O. The end result of all this inflexibility was to incur expensive change-orders late in the project cycle, or to push hardware design back later in the timeline, potentially delaying overall project delivery.

But with Electronic Marshalling, all our project engineer needs to get started is an approximate total I/O count. Each and every channel is fully characterized by its respective CHARM plug-in, which can be added or changed even up to the last minute without impacting the overall hardware design. Each I/O channel is mapped in turn to its appropriate controller automatically through the DeltaV system software, and can be logically reassigned even on the fly. And, in the rare case of a CHARM failure, annunciation is instantaneous and replacement of a single CHARM is much easier than that of an entire board, significantly reducing mean-time-to-repair.

The decades-old practice of landing wires in a marshalling cabinet, then wiring each landed pair to an I/O channel on the right kind of card connected to the right controller, is eliminated—along with the marshalling cabinets themselves. All of this greatly streamlines system engineering and documentation.

Plus, you can begin building—or just order—the cabinets you need before you’ve even finished the process design. Automation is no longer a project bottleneck and is off the critical path. And the benefits don’t stop when a project is completed. Because each I/O channel can be re-characterized at any time by simply changing its CHARM, flexibility for the future is preserved as well.

Q So, the need for physical marshalling cabinets essentially disappears. Have some traditional work processes disappeared as well?

A When you think of the traditional hardware factory acceptance test, or hardware FAT, it’s really all about the I/O. You’re not testing the controllers themselves; you’re testing all the wires that were pulled, the screws that were turned, and the cabinets that were built over perhaps the past 10 months on a big project. But if all of that custom panel-building and cross-wiring goes away, you can cut much of the FAT as well. With Electronic Marshalling we’re seeing an extreme reduction in FAT and commissioning time. One large oil company, for example, is going as far as creating a new “no hardware” FAT methodology that acknowledges this new reality.

Q. Is there more to I/O on Demand than just Electronic Marshalling?

A. While Electronic Marshalling is at its heart, I/O on Demand also describes a broader human-centered design (HCD) effort at Emerson Process Management that includes both WirelessHART and FOUNDATION fieldbus networks. Emerson Smart Wireless networks, which are approaching 2 billion hours of operation across more than 10,000 wireless systems, provide an easy, seamless way to add “wireless I/O” wherever and whenever the need for a new measurement point arises.

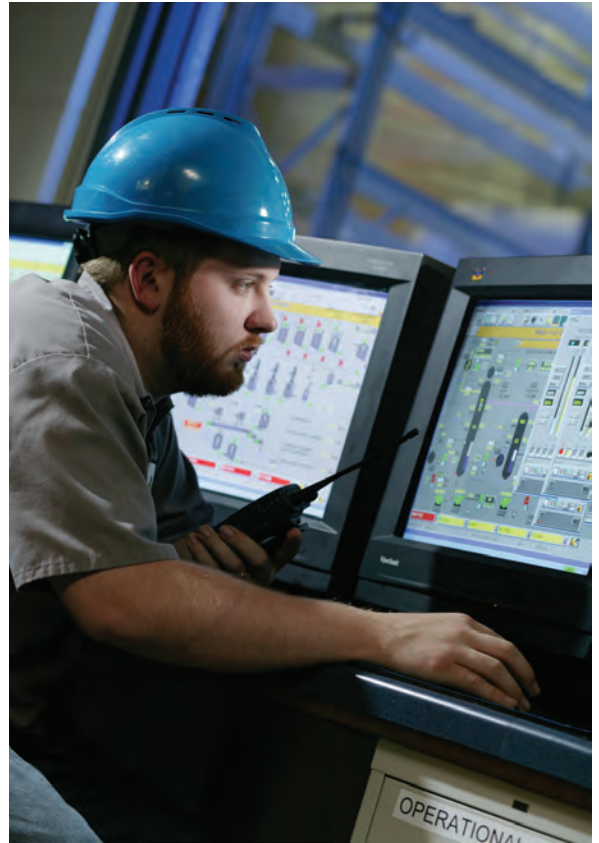
FOUNDATION fieldbus technology normally requires third-party power supplies and power conditioners—along with the necessary engineering and wiring and cabinet space. But with DeltaV S-series and I/O on Demand, we’ve integrated the power circuitry within the FOUNDATION fieldbus H1 card itself. The additional cabinet footprint associated with use of external segment power supplies is eliminated, along with segment power design, installation and troubleshooting tasks. In short, the third-party power conditioners and dedicated power supplies—and all the engineering and testing that went with them—also are a thing of the past.

Another way in which we allow users to further leverage their I/O investment is in the seamless communication of the DeltaV SIS process safety system information to the basic process control system. In this way, information from safety I/O can be used to allow the control system to make more informed decisions.

Q. How else has HCD driven changes in the original I/O on Demand offering to meet other user needs?

A. Key technology extensions over the past few years include the launch of the modern DeltaV SIS with Electronic Marshalling, which delivers all the same time, space and flexibility benefits to the engineering of safety system I/O. And, just as Electronic Marshalling eliminated marshalling cabinets, intrinsically safe CHARMS have eliminated stand-alone safety barriers—and the need to engineer, install and enclose those components as well.

The beauty of HCD is that it provides a powerful way of helping change the way we do



“HCD helps us transcend work processes that as an industry we long believed were unavoidable.”

things. It can help us to transcend work processes that as an industry we’ve long believed were unavoidable. Electronic Marshalling is representative of the ways in which Emerson is striving to remove complexity where we can, eliminate work where possible, and embed knowledge where practical. ■

“In the limited time available, it would have been impossible to migrate this system using traditional methods.”

— Daniel Morales,
Automation Manager,
Braskem

Put Time on Your Side

Whether Modernizing or Building New, Electronic Marshalling Can Buy Time When You Need it Most.

Daniel Santos Monasterios Morales knows what it's like to be on a project's critical path. He's been there.

Automation manager for Braskem's petrochemical facilities in southeastern Brazil, Morales oversaw a recent control system modernization project for one of the company's polypropylene production facilities. Two factors weighed heavily on the company's modernization plan: the desire to re-use existing field wiring, and the need to fully execute the transition to a new control platform within a narrow 15-day turnaround—only a fraction of which could be used for automation activities.

“In the limited time available, it would have been impossible to migrate this system using traditional methods,” Morales says. Enter Emerson Process Management and its Electronic Marshalling technology. The migration team tested everything on the new DeltaV system out beforehand, and when it came time for the switch, “We just moved the old FTAs [field termination assemblies] out, and the CHARM I/O cards in. This was straightforward because we didn't have to concern ourselves with rearranging cables from the field,” Morales says.

Morales estimates that the flexibility of the



Electronic Marshalling solution allowed them to design and install the new system in 50% less time compared with conventional I/O approaches. The team met their “impossible” project deadline, and the plant was back up and running on schedule. Further, Morales credits this approach with a 19% installation cost savings and a 15% design cost savings.

For Braskem, the truly critical-path time savings afforded by Electronic Marshalling was in the system installation and commissioning. With this approach, once the new CIOCs are in place field technicians can quickly land the existing field wiring on any available I/O channel without regard to type. Subsequently, each channel is given its appropriate character by simply plugging in the appropriate type of

characterization module, or CHARM. The mapping of each I/O point to the appropriate controller in the system is done through the DeltaV system software with very little effort. In the end, Electronic Marshalling can save time and prevent mistakes just when the migration team is under the most pressure to get the plant back up and running.

HCD in the Details

While Electronic Marshalling represents a conceptually different approach to doing automation projects, Emerson’s focus on human-centered design (HCD) also is apparent in the smallest implementation details that can streamline system installation and commissioning tasks. For example, the DeltaV CIOC itself has been designed for ease



“We just lifted the wires off the old I/O card, landed them on the new terminals, and—boom—it was talking.”

— Glen Pfeifer,
Controls Specialist,
E.R. Carpenter

of use, both in physical installation and its software tools. Components snap together with secure DIN-rail latches and interlocking carrier connectors; a series of 96 I/O channels can be connected to a DIN-rail in a matter of minutes.

No tools are needed to remove a CHARM or CHARM terminal block from the baseplate. Upon initial insertion, CHARMS are sensed by the system, automatically creating the I/O definition in the DeltaV configuration database. Also, upon initial insertion of a CHARM, each terminal block is “self-keyed” such that the wrong type of CHARM cannot be mistakenly inserted without removing and manually resetting its terminal block (again, without tools).

CHARMs also can be partially ejected to a stand-by position, disconnecting the field wiring from the system to perform field maintenance actions or to remove power to a field device. Activating the CHARM latch ejects the CHARM to the stand-by position. Closing the latch locks the CHARM in place and isolates the field wiring for field work.

For Glen Pfeifer, controls specialist for chemicals manufacturer E.R. Carpenter LP, a recent control system retrofit at its Pasadena, Texas, facility “worked out wonderfully” with Electronic Marshalling technology. The modernization project involved new DeltaV control and safety instrumented systems for two units, each consisting of 550 I/O points.

They reused the old systems’ remote I/O cabinets, landing new wires from newly installed remote CIOC field enclosures on new terminations installed on stand-off brackets in the old remote I/O cabinets. “We were able to completely commission the new controls, the network and the CIOCs all the way to the new termination points in the old cabinets,” Pfeifer says. When it came time for the cut-over, “we just lifted the wires off the old I/O card, landed them on the new terminals, and—boom—it was talking.”

Commissioning definitely went faster than with traditional approaches, Pfeifer adds, citing the ability of each I/O channel to self-identify and self-configure. “The simultaneous enabling and downloading of multiple I/O channels was helpful; the system software worked just as I expected it to, and for the most part I couldn’t think of a better way to do it.”

An Earlier Start

While Electronic Marshalling shines under the pressure of a retrofit cut-over, its ability to save time and associated expenses is perhaps even more apparent in greenfield projects. Here, time can certainly be saved in installation and commissioning, but the real game-changer is in the ability to start automation system design earlier in the overall design process.

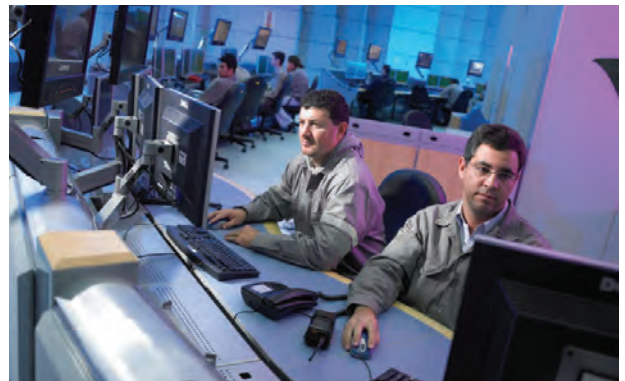
Classical marshalling, the old way of doing I/O, is at the heart of a labor-intensive, relatively inflexible work practice that also is subject to the whims of late-stage process design modifications. Changes in process design drive changes in control system inputs and outputs required, and proceed to cascade through all that detailed engineering work—from reworking drawings to control system partitioning to building new cabinets. Late design changes are inevitable, but they add cost, time, and most importantly risk to any project. The practice of wired marshalling only intensifies these problems.

But what if the nature of any single I/O channel could be changed at will, at any time during a project? What if all marshalling cabinets and junction boxes were of a “standard” design, and need not be engineered beyond knowing an approximate total I/O count? That’s precisely what Electronic Marshalling brings to the table. As a result, it effectively removes I/O from the critical path of many projects—decoupling process design from I/O architecture decisions as well as eliminating the rework costs and project delays that were once the inevitable consequence of late-stage design modifications.

While important to owner-operators, the technology also has proven popular among innovative engineering and procurement contractors like WorleyParsons, which engineers, designs and builds plants and platforms and works with Emerson to provide the automation systems. “As our customers ask us to take on increasingly large, complex projects -- often with fast-track schedules—changes late in the design process are inevitable,” says Robert Armstrong, chief instruments and controls engineer, WorleyParsons. “Electronic Marshalling streamlines how projects are designed and engineered and as a result, has helped control the cost and schedule impact of last-minute changes.” ■

“Electronic Marshalling streamlines how projects are designed and engineered. It has helped control the cost and schedule impact of last-minute changes.”

— Robert Armstrong,
Chief Instruments and
Controls Engineer,
WorleyParsons



“Electronic Marshalling gave us the opportunity to use that space for operations instead of as a place to hang computers.”

— Eric Phares,
Automation Engineer,
Johnson Matthey

Shrink Your System Footprint

Cut Your Control Room I/O Cabinet Commitments in Half. Or Better Yet, Move them all into the Field.

Even in the cheapest real estate markets, control room space comes at a premium. But what if your plant has run out of elbow room, and company planners are itching to put your control room floor space to more productive use?

Such was the situation described by Eric Phares, automation engineer at Johnson Matthey's West Deptford, N.J., facility, where a range of active pharmaceutical ingredients (APIs) are produced. The company is in the process of migrating older Emerson PROVOX control systems over to the DeltaV system. And for the unit in question, they chose to go

with Electronic Marshalling in no small part because it would allow them to readily move the system I/O out of the control room and into cabinets distributed throughout the production environment.

“Electronic Marshalling allowed us to distribute that I/O out to the process,” Phares explains. “It gave us the opportunity to use that space for operations instead of a place to hang computers. And for a small facility like ours, even a hundred square feet is a big deal,” he says.

The control room that was once the home-run destination of hundreds of instrument wires



now holds only a single DeltaV workstation—and that’s likely to go, too, in anticipation of the control room’s eventual demise. Now, instead of bundles of copper running back to the old control room, the 17 field enclosures feed six CHARM I/O card (CIOC) enclosures fiber optically linked to a DeltaV controller cabinet and six DeltaV workstations, all of which are situated in the Class I Div 2 production floor environment.

Johnson Matthey also is reaping performance and functionality benefits with the new system. “Instrument techs have remarked that the Electronically Marshalled instrument loops are performing more precisely,” Phares says. And, now that the new system is in place, they’re adding

new functionality starting with the automating of reactor inertion and pressure testing sequences that weren’t readily doable with the old system. “Now we can, so we do! We have the ability to make a lot of good things happen now,” Phares says.

Built for Offshore Demands

From the very start, Electronic Marshalling was intended not only to collapse project schedules and reduce engineering and installation effort, but also to address the often extreme space and weight limitations of offshore production platforms. The effective elimination of marshalling cabinets was a huge first step toward smaller I/O cabinet footprint. Further, with the

“Intrinsically safe CHARMs significantly reduced the cabinet size because we didn’t have to include separate barriers and terminations.”

— Mostafa Lakosha,
Instrumentation and Control
Engineer, BG Rashpetco



introduction of intrinsically safe CHARMs, the need for separate third-party barriers—and all the engineering that went with them—has disappeared as well.

The ability to install Emerson’s CIOCs in standardized field enclosures with standard wiring out to the instruments and a fiber optic network link to the rest of the system reduces control room I/O cabinet requirements to essentially zero, as well as reducing the amount of copper wiring required, an added weight savings bonus for offshore installations.

BG Rashpetco, an Egyptian natural gas producer, took advantage of these new system features recently when it modernized the controls on a gas metering skid. They chose the DeltaV platform to improve connectivity with other process control systems, but Electronic Marshalling also paid off in saved space and installation time. “We used intrinsically safe CHARMs, which significantly reduced the cabinet size because we didn’t have to include separate barriers and terminations,” says Mostafa Lakosha, instrumentation and control engineer. “This also reduced the time required for installation.”

Another big advantage is that we can use just the number of I/O necessary,” Lakosha adds, “instead of buying extra cards to accommodate the I/O mix we needed.”

Reduce and Reuse

Meanwhile in South Africa, AEL Mining Services, a manufacturer of mining-related chemicals and explosives, was able to both reduce system footprint and reuse its existing marshalling cabinets during a recent control system modernization project, according to Leon Clulee, senior project manager for AEL.

Fortunately, the AEL team had room to install the new CIOCs inside the existing system marshalling cabinets. “We got the new system up and running in parallel,” Clulee explains, “and were able to shutdown and switch over quite seamlessly. Some loops were even switched over while the plant was running.”

The old marshalling cabinets—which now double as the new I/O cabinets—are connected via Ethernet to the now sparsely populated controller cabinets. “The DeltaV controller now sits in one corner of the cabinet,” Clulee says. “We saved four square meters of floor space, and are going to move other servers in there now.”



With the modernization to the DeltaV system, the company also saw control performance improvements. For example, a boiler that had been run in manual for decades now runs consistently and predictably in automatic mode. “We’re running more efficiently, and operators are freed up to do other tasks,” Clulee says. “Operators can walk the floor to see what needs attention, rather than just staring at a screen. They have more time to look at what can be improved instead of doing mundane tasks.”

“We’re currently rolling out the same approach to the rest of our chemical plants, installing the CIOCs inside existing cabinets while the plant is running, ‘dry-commissioning’ the system while the plant is online, and then taking the opportunity during a plant shutdown to change-over the control to DeltaV. The installation and configuration process is quite painless.”

These plants will all be linked together via a redundant fiber optic network, putting all of the plants on the same control platform. Plant operators who once controlled the units in isolation will now have better visibility upstream and downstream, and into how the performance of their unit impacts the bigger system. ■

“The DeltaV controller now sits in one corner of the cabinet... We saved four square meters of floor space.”

— Leon Clulee,
Senior Project Manager,
AEL Mining Services



“The DeltaV engineering tools are as important as the Electronic Marshalling. The combination of technologies is very powerful.”

— Bob Crawford,
Staff Engineer,
TPC Group

Streamline Engineering Tasks

Human-Centered Design Approach Yields Everyday Engineering Efficiencies.

While Emerson Process Management's DeltaV with Electronic Marshalling technology particularly shines in the face of looming project deadlines, it can also reduce effort and streamline engineering tasks when you're not quite so crunched for time.

Indeed, the effective elimination of marshalling cabinets—as well as separate intrinsically safe barriers if you need them—also eliminates much of the

engineering effort that goes into them. And because with Electronic Marshalling each uncharacterized I/O channel is much the same as the next, the only remaining variable associated with the cards, cabinets and field enclosures is: How many of each do you need? Electronic Marshalling technology also comes with all the power of DeltaV's engineering tools, which can help streamline and manage what configuration and programming tasks remain.

“We helped out for two weeks on the first two reactors, but now they’re doing it on their own.”

— Donald Bockman,
Account Manager,
Proconex

TPC Group, for example, is in the midst of a staged modernization of the control systems at one its Gulf Coast petrochemical facilities. They’re transitioning a few process units at a time over to the DeltaV system, and ultimately will Electronically Marshal all of their I/O. “And we’re not taking any of our processes down,” notes Bob Crawford, staff engineer in the company’s process automation group. “It’ll be hot cut-over on more than 5,000 I/O when all’s said and done.”

In helping to manage this systematic transition, “the DeltaV engineering tools are as important as the Electronic Marshalling,” Crawford adds. “For example, the ability to download Excel spreadsheets of configuration data allows us to do things more quickly and easily. And with DeltaV and AMS, we have a lot more diagnostics and configuration power than before,” Crawford says. “The combination of technologies is very powerful.”

Crawford also appreciates the single channel flexibility afforded by Electronic Marshalling, which allows them to logically group I/O together on the same CHARM I/O card (CIOC), rather than, for example, having the I/O associated with a single pump wired to several traditional I/O cards of different types. “Because you can put those I/O together, it’s much easier for the technician to manage and troubleshoot. It’s a whole new concept compared to the old days. Open space and spares can go anywhere. The possibilities are endless.”

Scalable for Small Projects, Too

While Electronic Marshalling was designed with industry’s most demanding and complex process automation applications in mind, it can also make relatively small modernization projects easier to manage and execute than previously thought possible.

For example, in researching this article we spoke to a research engineer who recently moved into a role that includes supporting the water treatment facilities for the company’s research and development labs. He confessed to having had limited controls or instrumentation experience up until two years ago, but nevertheless was able to recognize the potential for Electronic Marshalling to help modernize operation of the water treatment facility’s holding tank area.

Tanks with existing standalone controllers and sump pumps were scattered several hundred feet from a central control room, “and we didn’t have a good way of marshalling that wire to one



location,” he explained. Further, the pilot plants run continuously so a shutdown was out of the question. In the end, four CIOCs were installed in remote field enclosures, with network cables back to a controller in the control room.

Despite his inexperience with controls in general and the DeltaV system in particular, our researcher was able to develop the sump pump logic on his own and bring it online first before tackling the other sections in turn. “Electronic Marshalling allowed us to wire one area at a time, then plug in that network card. We were able to transition without shutting down.” Today, they’re using DeltaV to implement new strategies previously unachievable, for example, to automatically reroute flow among the holding tanks to avoid overflow conditions. “But the real beauty was when someone wanted to add another measurement as an afterthought,” he said. “We just wired up the device, put in a spare CHARM, and it was done.”

DIY Resurgent

Our researcher is only one of a growing class of process automation do-it-yourselfers finding that Emerson’s focus on human-centered design (HCD) has made a big difference in what types of projects they can comfortably execute without turning to outside expertise. Indeed, both AEL Mining Services and Johnson Matthey, whose Electronic Marshalling implementation experiences are detailed elsewhere in this special report are proceeding—and succeeding—largely under their own steam.

Drugmaker Johnson Matthey enlisted the help of Emerson local business partner (LBP) Proconex to modernize the control systems for the first two of 18 similar reactors at its West Deptford, N.J. facility (see p12 for more project details). “We helped out for two weeks on the first two reactors,” says Donald Bockman, Proconex account manager, “but now they’re doing it on their own.”

And at South Africa’s AEL, “they just bought the hardware, installed and configured it themselves,” according to Alan Windram, engineering manager for process systems and solutions for Emerson LBP Automation and Control Solutions. “Our LBP helped guide us in what to buy,” says Leon Clulee, senior project manager for AEL (see p14 for more project details). “But we wanted to do the work ourselves so that the guys who are here understand the system and know what to do in the middle of the night.” ■



“They just bought the hardware, installed and configured it themselves.”

— Alan Windram,
Engineering Manager,
Automation and Control Solutions



“Electronic Marshalling means faster commissioning, faster loop checks and faster modifications.

Within Sasol, it's a new way of thinking.”

— Dr. Andre Joubert,
Manager of Control Systems
and Instrumentation,
Sasol Technology

Be Ready for What's Next

DeltaV with Electronic Marshalling Sets New Standard for Operational Flexibility in the Face of Unrelenting Change.

For Sasol Technology's Dr. Andre Joubert, flexibility for the future means a whole lot more than just spare I/O capacity.

Joubert is manager of control systems and instrumentation for the research and development arm of the international energy and chemical company, which not only builds and operates world-scale production facilities, but also develops

and commercializes process technologies. At its main R&D center near Johannesburg, South Africa, myriad manufacturing processes are tested and optimized in pilot-scale facilities—including a 40-m tall tetramerization unit with 3,800 intrinsically safe I/O that is being used to determine optimal operating strategies for the company's new chemicals complex under development in Lake Charles, Louisiana.

“Electronic Marshalling is very flexible to any changes, including reconfiguring some I/O connections at late stage of the project.”

— Chan Jeong Park,
Manufacturing Technology
Team Leader,
Hanwha Chemical

At the Sasol R&D site, pilot plants are routinely switched from one configuration to another, entailing perhaps 40 to 80 instrumentation changes during a 30-day turnaround.

‘Change Is Always Happening’

“We have an extremely complex management of change process, and the ability to do rapid modifications is key,” Joubert says, “but to turn around more quickly, we had to move away from the conventional way of doing things.” They had already been using DeltaV process automation systems with M-series I/O, but are now moving to S-series I/O with Electronic Marshalling because of its greater flexibility.

Because each I/O channel can be individually characterized to be an analog or digital input or output with its plug-in CHARM module, a channel that served as an analog input in the last run can easily be changed to a digital output for the



next. Just swap out the CHARM, run the wiring to the card, “and away you go,” Joubert says.

The company also has settled on installing the CHARM I/O cards (CIOC) in field-mounted enclosures. This approach minimizes size of their equipment rooms, where only the DeltaV controllers are housed, and allows the company to “save a ton of money” by running the control system’s fiber optic network cables together with the electrical power infrastructure.

“Our documentation has gone down by 90%,” Joubert adds, “and the systems are far easier to maintain as well.” Joubert also cites a recent factory acceptance test (FAT) that was scheduled for three weeks but completed in just one. “It’s so much easier to check,” Joubert says. “We’re cutting out some of the normal problem areas. We can now turn around a large, semi-commercial unit in eight weeks, and now we’re targeting six. This new technology will allow us to do that.”



Flexibility for the Future

Pilot plants aren't the only type of facility to benefit from the high degree of built-in flexibility afforded by Electronic Marshalling. Hanwha Chemical is a leader in South Korea's growing market for biosimilar pharmaceuticals, and the use of Electronic Marshalling helped the company to quickly ramp up production of recombinant monoclonal antibody and antibody-based protein drugs at its recently completed Osong plant.

Chan Jeong Park, manufacturing technology team leader, credits Electronic Marshalling with easier project management during the plant's design and construction phases. It not only reduced the site construction time and cost, but also provides a foundation for future I/O expansion and plant management because the I/O cards themselves are installed in the proximity of devices in the process area. "Moreover,

it is very flexible to any changes," Park adds, "including reconfiguring some I/O connections at late stages of the project."

For both Hanwha and Sasol, the agility of their Electronically Marshalled systems to gracefully accommodate changing process requirements only reinforces other key system benefits: speed of project delivery, smaller system footprint and engineering ease. Taken together, they represent an overwhelming value proposition compared with traditional marshalling.

"Electronic Marshalling is the future for us," Sasol's Joubert says. "It means faster commissioning, faster loop checks and faster modifications. In the past, we had problems justifying new technology investments because of the cost, but once we started delivering on the shorter turnarounds, everyone's attitudes started to change. Within Sasol, it's a new way of thinking." ■



Another I/O change? Great.
So another wiring schedule.
Another marshalling design.
And another cabinet...
Just make it all go away!

YOU CAN DO THAT



DELTA V

Electronic marshalling eliminates the rework, the redesign and the headaches.

With DeltaV Electronic Marshalling, Emerson lets you make I/O changes where and when you need them without costly engineering and schedule delays. Our new DeltaV CHARacterization Module (CHARM) completely eliminates the cross-wiring from the marshalling panel to the I/O card—regardless of signal type—so you're no longer held to predefined specifications. All those wires, gone. All that time and engineering, gone. See how easy it can be by scanning the code below or by visiting IOonDemandCalculator.com



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