

Application Story:

PROFINET Makes Oil and Gas Drilling Rigs Smarter



Precision Drilling: Calgary, Alberta

"I needed to future-proof my drilling equipment. PROFINET does that."

—Darcy Falardeau, Vice President Operations North America

Improving worker safety...

The days of “dumb iron” in North America’s oil and gas fields are numbered. That’s the conviction of Darcy Falardeau of Precision Drilling Corporation, who sees modern communication networks like Profinet making drilling rigs and the associated on-site equipment smarter, and making the overall drilling process safer and more efficient.

“We see Profinet as future-proofing our equipment because of its expandability.”

“Our customers can benefit from real-time information from their drilling equipment and that’s what our new centrifuge control system and its Profinet network provide,” says Falardeau, who is Vice President Operations – North America for Precision’s Completion & Production Services division. The Canadian-based company, whose drilling division has been working in

the U.S. for the past six years, is one of the continent’s largest providers of drilling services and drilling equipment.

“Engineers and operators can now monitor, in real time via Profinet, centrifuge performance, and other key information from various other support equipment such as our horizontal tanks for mud storage. This integration has the ability to reduce downtime and improve worker safety, which are key industry priorities in today’s performance driven marketplace”, explains Falardeau. “When potential problems occur, we can troubleshoot them remotely, which means reduced travel out to the field, reducing our workers’ exposure to risks, and providing quicker resolution of the problem. The end result is a more productive and safe operation.

... and drilling well performance

“And with greater visibility into their operations, engineers and operators can be more proactive. Just

as important,” he adds, “the information gathered from our on-board systems, allows us to learn from one job to another, which is then applied to improve the performance of future drilling operations.”

Information from the centrifuge HMI can be fed directly into a Pason reporting system that handles data acquisition, drill site reporting, and data management. The benefit being all information is displayed at a central location and viewed by multiple users simultaneously.

Easy connectivity

The new centrifuge control and communication system was first used in conjunction with one of Precision’s Tier-1 Super Single drilling rigs, which are most often used to drill for oil and natural gas in shale deposits. The centrifuge, which is typically required on wells over 1,500 meters deep, cleans and screens out the formation cuttings from the drilling mud during drilling. The mud also acts as lubrication during drilling operations, so having a way to continually monitor centrifuge performance is crucial.

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The system combines a soft-PLC plus HMI residing on a single industrial PC, all supplied by Phoenix Contact. The soft-PLC controls the distributed I/O and the drives for the motors that power the centrifuge. Profinet connects everything. The drives are routed through a standard Ethernet switch and connected in a line configuration.

One part of the modular I/O has an RS-485 port integrating an existing Modbus network that controls other functions on the centrifuge. Another section has an RS-232 GPS radio attached for remote connectivity. Other sections include analog and digital I/O for temperature and other measurements.

TCP/IP communication is also run on the same network, and since Profinet is standard Ethernet, everything uses the same network cables, reducing hardware requirements. All the devices are already connected on Profinet, so as much data as needed can be configured.

Future-proofing drilling equipment

“We see Profinet as future-proofing our equipment because of its expandability,” says Falardeau. “It’s a

real differentiator for us, because none of our competitors are offering these capabilities.

“We’ll be able to add unlimited devices and functionality to the network as needed in the future as customers see the benefit of more features and process information,” he explains, pointing out that the Profinet network has the ability to connect to the rig’s mud tanks and pumps. “Eventually all the equipment on a drill site will be connected and feeding back information back to a central point of contact.”

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Precision Drilling, which operates a North American fleet of over 300 drilling rigs, and several other service lines such as their Rentals division, plans to use Profinet on more of their future equipment lines, according to Falardeau. “Profinet is consistent with our corporate mission to provide High Performance and High Value to our customers. We’re in the infancy of what we can do to provide all the information customers need to become more efficient. As wells reach deeper and further out, immediate access to operating information will become ever more important.” Profinet does that.

