BEDROCK®
OPEN SECURE AUTOMATION

Case Study

Pinnacle Midstream Future-Proofs Texas Oil & Gas Operations

The Bedrock® OSA® Platform aligned perfectly with Pinnacle Midstream's philosophy of creating customer value by leveraging cutting edge, innovative technology to deliver higher quality product with improved profitability.

SUMMARY

Customer requirement: An efficient, flexible and scalable automation platform with maximum reliability in rugged conditions - including protection from cyber intrusion

Bedrock Automation solution: Bedrock® OSA® platform

Result: A highly efficient, cost effective flow management solution that coordinates IIoT edge control, and scales to meet anticipated DCS growth requirements

Pinnacle Midstream was formed by a group of seasoned oil and gas executives who have a vision for changing the profitability dynamics of the mid stream oil and gas market and believe technology will play a significant role. Pinnacle focuses on installing and operating value-added solutions that free midstream production facilities to focus on continued development of field oil and gas assets while benefiting from the economies gained by extending oil and gas gathering systems to neighboring producers. Pinnacle tailors each customer solution for

compression, treatment, processing or dehydration of a producer's oil and gas to derive the highest market value. They pride themselves on installing cost effective and efficient systems by utilizing cutting edge equipment to deliver oil and gas to the market that is both high quality and profitable.

When Pinnacle set out to add new delivery points in West Texas, they turned to Meers Engineering, a Texas-based systems integrationfirm that was already implementing Inductive Automation's Ignition™ SCADA interface and management software for

them. Together, Pinnacle and Meers concluded that a long-term strategic plan for control automation -- one based on the most modern industry standards and protocols -- would establish the foundation they needed to accommodate anticipated growth. Pinnacle's philosophy on leveraging cutting– edge technology led Meers to conclude that the Bedrock system was the right answer for their automation controls. Bedrock's open, secure automation platform not only offered the best combination of efficiency, flexibility and reliability for

Pinnacle's current pipeline control and safety needs, it could easily scale to meet future needs, including a potential future transition to a DCS application.

Up to the Task

Meers also felt that Bedrock's long list of advanced features – many of which can't be found in any other system today – would help Pinnacle "future-proof" its approach right out of the gate. Key attributes such as intrinsic cyber security, environmental hardening, and large-scale processor data logging were just a few of the platform capabilities that convinced Pinnacle that the Bedrock platform was aligned with their company's technology philosophy. There was also a need to overcome the challenges posed by remote and rugged locations, as well as the demand for high performance and secure reliability.

"That is what Bedrock does best" said David Ibach, a Meers Automation principal. "Bedrock's construction makes it ideal for very, very rugged conditions. That was certainly something in their minds. The completely enclosed metal cases provide critical protection in these very sandy, dusty areas. Then there are the extreme temperatures – which can really
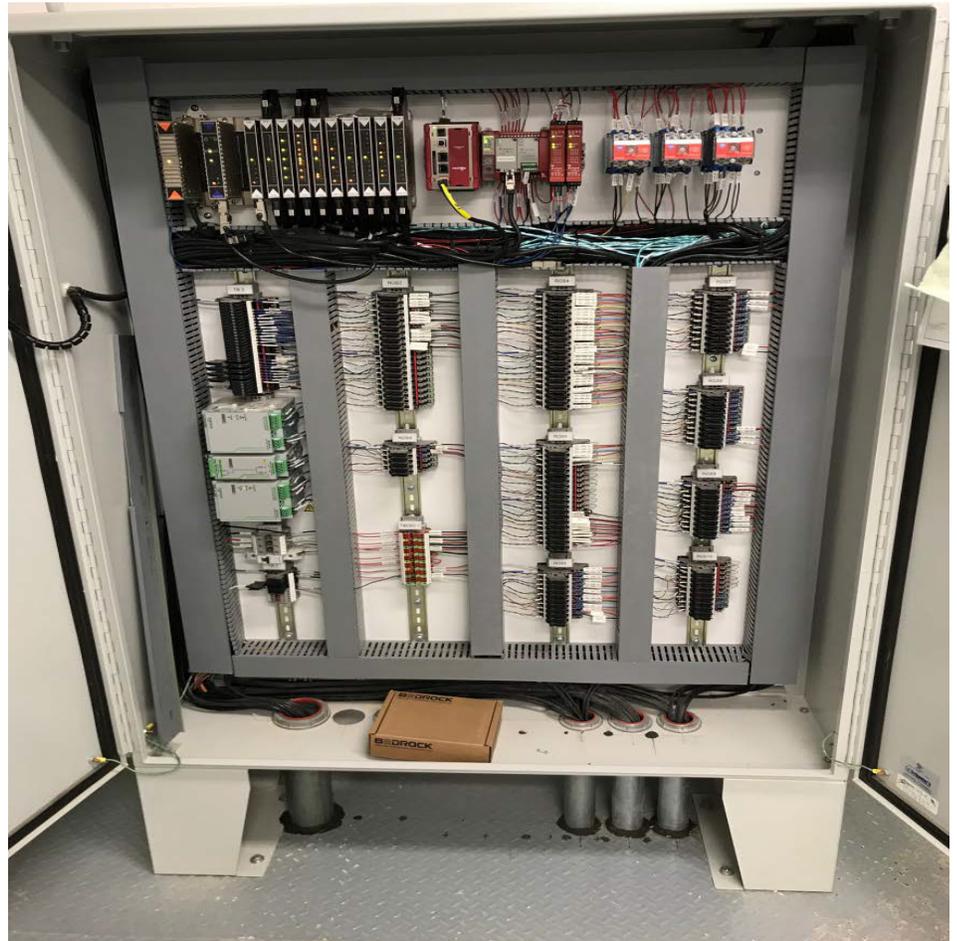
pose a problem with lesser controls. Lightening is a real problem out here as well, so Bedrock's EFT resistance is a big deal. Pinnacle actually had some equipment go out due to lightening in the past, which poses a significant safety concern." Bedrock's ability to lock down system cyber-vulnerability – given that concerns around potential attacks on critical infrastructure assets continue to escalate – was simply a "no–brainer" and a welcome aspect of Bedrock's value proposition, according to Ibach.

The platform's overall efficiency helped complete the picture for Pinnacle. Bedrock's non-obsolescence guarantee was a big value-add, according to Ibach. "That's huge for them" he said. "They want equipment that's going to last a long time, and that's going to keep a lid on total cost of ownership. Features like the universal, software configurable I/O represent a big savings because Pinnacle will need to buy fewer I/O modules for the same applications. Being able to put any I/O point anywhere is really nice

- enabling them to do that on the fly with software, changes the game entirely. As their integrator, we were also impressed with the powerful capabilities designed into the Bedrock controllers. You can tailor any solution very elegantly and the object-oriented programming allows us to easily customize and troubleshoot applications right in the controller itself. And all of this comes in a physical format that results in a significantly smaller solution footprint that requires less engineering to commission."

Solution Profile

This solution manages midstream crude that's being held in storage tanks, and subsequently transferred into trucks and pipelines. That means controlling the flow of the oil into the tank, out from the tank and into trucks and pipes as well. The only thing the Bedrock system doesn't currently control is the actual volume metering, because legal certification is required for amounts transferred. It's not about system capability, but rather an approved, validated audit trail provided by pre-validated metering devices.

Pinnacle and Meers both felt Bedrock offered superior flexibility compared to other potential

solutions. "We are able to store data in the processor - not something you can do with competing brands." Ibach adds. "That allows us to log data, events, and sequence of events right in the controller. The sheer speed and simplicity of getting accurate data, in real time, into the controllers is impressive. It also minimizes bandwidth requirements that would otherwise be needed to push that data to other applications." The system incorporates numerous digital and analog inputs/outputs, communicating with multiple devices via Ethernet, all of which are tied into and secured by the Bedrock system. Another aspect of flexibility was Bedrock's Integrated Development Environment (IDE) and its powerful programming capabilities, which allowed Meers to pass substantial engineering savings on to their customer.

Pinnacle's implementation in its current configuration populates the Bedrock pin-less backplane with ten I/O modules, including ten-channel universal I/O modules and a five-channel Ethernet module. The universal I/O modules connect to the field computers, which control flow at each storage tank. The Ethernet I/O connects with IIoT edge devices

and applications to mine data for subsequent planning and operational improvement. The Ethernet modules also poll radios on wireless sensors simultaneously and support Power over Ethernet (PoE), which simplifies installation further by eliminating the need to run additional wiring to some of the devices.

Mike Hillerman
VP of Engineering and Operations, Pinnacle Midstream

"The Bedrock system provides an economical solution in a small, easy-to-implement system that can coordinate edge control today, while also scaling easily and economically to the full DCS functionality we expect to need in the future."

Bedrock control modules integrate switching and other functionality usually relegated to external devices, reducing wiring and installation costs. This also makes it very easy to scale up in 5, 10 and 20 backplane unit increments.

To the Future... and Beyond!

The solution was commissioned in January 2017 and is fully operational. Ibach feels it was very easy to implement with a short learning curve, which from a

start-up perspective is a huge time saver. He cites ease of use, the IDE's intuitive interface and power, as well as the ability to software configure the system as competitive differentiators. "The Bedrock system is very start-up friendly. It delivers performance surpassing all mainstream systems and can scale easily as the user's business grows. It uses state of the art electronics and is designed to work for decades. Its free IEC 61131-3 compliant engineering tools also saved a great deal of coding time during the installation and will continue

to reduce maintenance costs for many years to come," said Ibach. "We now have a powerful and flexible engineering solution that can be put together quickly and easily at a competitive cost for the customer."

Mike Hillerman, VP of Engineering and Operations for Pinnacle put it all in perspective. "We are expanding to the meet the growing need for midstream services and need a secure way to centralize flow control amongst our facilities. The Bedrock system provides an economical solution in a small, easy-to-implement

system that can coordinate edge control today, while also scaling easily and economically to the full DCS functionality we expect to need in the future. We also liked the rugged Bedrock housing, which will resist the dust that gets into everything around here," said Hillerman.

Based on the system's performance to date and its inherent scalability, Ibach believes Bedrock will play a key role in this facility's expansion as well as other Pinnacle facilities, including global locations.

About Meers Engineering

Meers Engineering Inc. is a full-service engineering firm offering complete design services as well as design/build services by partnering with a construction company. Since being formed in 1995 they have expanded and now maintain a 10,000 square foot facility located in Abilene, Texas.

About Bedrock Automation

Bedrock Automation, based in San Jose, California, is the maker of Bedrock® the world's most powerful and cyber secure automation platform. This Silicon Valley company has assembled the latest technologies and talents from the automation, cyber security and semiconductor industries to build an unprecedented automation solution for industrial control based on three prime directives: simplicity, scalability and security. The result is a new platform of automation called OSA®, Open Secure Automation, with a revolutionary electromagnetic backplane architecture and deeply embedded ICS cyber security to deliver the highest levels of system performance, cyber security and reliability at the lowest lifecycle cost.