M.G. Bryan Shifts Business Model to Meet Challenging Oil and Gas Market Demands with Cloud-Based Solution

OEM and Rockwell Automation Develop Cutting-edge Solution to Sustain Pace with Production Boom

**Challenge**

M.G. Bryan, a heavy-equipment provider for the oil and gas industry, needed a scalable solution for remote asset management of fracturing vehicles.

**Solutions**

**Asset Performance Management (APM)**

- Rockwell Automation developed a new information system that leverages Microsoft’s Windows Azure cloud-computing platform for secure remote access to real-time information from a variety of (distributed) manufacturing assets.
- Relevant data from each of the trucks is collected and stored, enabling a powerful set of dashboards and reports to optimize vehicle and fleet performance.

**Results**

**Improved Business Model**

- Enables far more effective utilization of expensive assets
- M.G. Bryan able to offer new after-market support services

**Preventative Maintenance and Service**

- Real-time visibility into asset performance allows M.G. Bryan to offer preventative-maintenance alerts and services, as well as remote service capabilities unmatched in this industry

**Background**

In 2010, the U.S. stole the crown for world’s largest gas producer from Russia. In 2012, the International Energy Agency predicted the U.S. will surpass Saudi Arabia as the world’s largest oil producer by 2020. More large-scale oil and gas plays are being discovered that could shrink that time frame further. For this growth to become a reality, those in the oil and gas industry must keep a relentless focus on production.

M.G. Bryan, a leading heavy-equipment and machinery OEM based in Grand Prairie, Texas, has been helping oil and gas companies meet production demands for more than 25 years. The company supplies engines, generators, industrial pump units, oil field service equipment, and hazardous area power packs globally. Much new production is facilitated by hydraulic fracturing, where petroleum or natural gas is released from reservoir rock for extraction. M.G. Bryan sells and leases advanced fracturing pump trailers, trucks and skids to help producers capture these resources.
**Challenge**

Fracturing vehicles can cost upwards of $1 million. They operate in extreme, isolated environments and have many consumable components. Oil filters need to be replaced every 200 to 400 hours, and a complete engine rebuild is generally required after 4,000 to 7,000 hours of service. Downtime on a fracturing vehicle can cost $3,000 to $7,000 per day for internal costs alone – not even taking lost product revenues into account. Because operations are occurring in remote areas, where cell-phone reception is not even a given, most producers keep a backup vehicle on-site, so production can continue if a vehicle goes down.

This use of backup vehicles makes fracturing operations expensive. Many smaller and mid-sized oil and gas producers lease fracturing equipment by the month, and are not experts in equipment control systems or maintenance. Producers are often looking for ways to cut costs and improve ROI on rented or purchased equipment in order for this approach to be a worthwhile investment.

To help its customers maximize ROI, M.G. Bryan needed to understand how its equipment was performing in real time to cost effectively keep tabs on performance and help customers maximize asset uptime.

**Solutions**

M.G. Bryan teamed with Rockwell Automation to develop a new control and information system for its fracturing vehicles that leverages the Microsoft Windows Azure cloud-computing platform combined with the FactoryTalk® software suite for secure remote access to real-time information.

The new tightly integrated control and information system brings together disparate information sources, including historical, relational and transactional data. To fully leverage this rich data without requiring M.G. Bryan or its customers to build and manage their own data centers, Rockwell Automation utilized cloud computing.

“We needed a solution that would work the same for our first five trucks and our next 1,000 trucks,” said Josh Rabaduex, director of engineering at M.G. Bryan. “We also knew we did not want to make a huge upfront hardware investment or have to handle long-term system maintenance, so a legacy data center wasn’t going to work for us.”

Using mobile technology and the secure and seamless transfer of business information over the cloud, M.G. Bryan has access to a higher degree of connected intelligence. “We can now pull data from the cloud via mobile devices and Web browsers to produce reports and dashboards on the condition of an individual vehicle’s drive train and fracking performance, as well as process performance and maintenance trends related to entire fleets,” said Rabaduex. “When you combine our new information system with the flexibility and scalability of cloud computing, we’ve really opened the door for a wide range of operations management solutions for our own vehicle fleets and those we sell.”
Results

The secure and instant visibility into remote-asset data has improved uptime and productivity for M.G. Bryan customers. For example, one customer called M.G. Bryan with a complaint that a leased vehicle engine was surging. This can be very dangerous as rapid changes in engine RPM will change the pressure in the iron pipes pumping water into the ground. If a pipe were to burst, it would not only shut down production, but it could create shrapnel that could injure or even kill workers on-site.

Such an engine surge could be caused by a number of factors: engine deterioration, ingestion of foreign material, an internal component failure, etc. M.G. Bryan personnel were able to immediately log in and review the data coming from the exact vehicle. They saw inlet pressure on the pump’s fluid end had dropped from 60 to 6 psi, indicating pump cavitation – the customer’s tanks were running out of water. They advised the customer to check tanks and open a valve that was accidently left shut. The entire scenario played out in just over 10 minutes. The customer averted sucking air into the fluid end and cracking it, saving a potential $60,000 in replacements parts, a 100-mile service trip, worker injury and lost production time.

Cloud Security

Change is scary, especially when you are hearing that you should consider moving important business data into a cloud. Clouds are fluffy, nebulous and fleeting. “It is important not to fall victim to a ‘my data needs to be behind a door’ mentality,” said Josh Rabaduex, director of engineering for M.G. Bryan. His company is leveraging a cloud-based information system for remote asset management of oil and gas equipment.

While the cloud can seem like a virtual world, in many cases it can actually provide better security and redundancy than a traditional system,” said Rabaduex. “If one site goes down, the others take over. This has proven to be one of the most stable environments for us and our customers, as there is now no one point of failure.”

Many companies today are under constant threat – both malicious (hackers and viruses) and accidental (uneducated employees and well-meaning contractors), among others.

At the same time, industrial enterprises are looking to cloud solutions because they can boost information access and productivity. The security of a cloud solution need not be a roadblock to adoption. In fact, such a solution can actually improve productivity through better security measures. This is because cloud solutions provide the greatest benefit when data is controlled granularly. Data should be looked at directly so it is secure, regardless of data location.

To achieve this level of security, industrial users need to design in security from the beginning, and to manage all layers – device, controller, process, mobile devices, enterprise and the cloud. In order to gain productivity from these new technologies, future data needs to be close at hand – in a pocket, at the well or in an airplane. Applications will be in public or private clouds, either on-premise or off. Data must be valuable, so validating the data and managing its access becomes the real concern, rather than focusing only on which devices or platforms it sits on and who has access.

Rabaduex added, “Because of the security measures we have in place – encryption, secure log-in, isolated networks with firewalls, etc. – and the design of our data collection, companies looking at our systems haven’t had any significant security concerns to date. We only push specific data sets to the cloud that would require additional data, which is not on the cloud, to put our customers or ourselves at risk.”

Security concerns are not a convincing reason to avoid cloud-based solutions or any new technology. Rather, producers should take a close look at potential risks and work with a well-versed team to conduct a thorough risk assessment before implementing new technologies. Rockwell Automation performs regular risk assessments to help identify potential threats and outcomes, and recommends the best response to keep companies prepared for the road ahead.
This solution has also opened the door to a new business model that reduces project risk and cost of production, while improving time-to-value for these fracturing vehicles. “Now that we can monitor vehicle use by the minute, hour and day, we’ve been able to change our leasing agreements,” said Rabaduex. “We’ve shifted from the industry-standard monthly agreements to a pay-by-use model. Our customers no longer need to rent equipment by the month, paying the same price for those vehicles that pump 24/7 as they do for its backup trucks that never see any action. They only pay us for the actual days the vehicles are in use.”

Current owners of M.G. Bryan fracturing vehicles have already ordered more than 25 vehicle retrofits to get this solution on their existing fleets. However, the company is not finished using the solution to spur innovation. “We are also exploring how this information can demonstrate performance to our customers and offer preventative maintenance,” said Rabaduex. “Now, we can produce hard data that demonstrates how our pumps and other components last longer. We can use hard data in warranty fulfillment. We can alert our customers when it’s time to swap out air filters or come in for an engine rebuild. The possibilities seem endless.”

The results mentioned above are specific to M.G. Bryan’s use of Rockwell Automation products and services in conjunction with other products. Specific results may vary for other customers.