

# Oil & Gas Technology Trend Watch

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As the upstream oil and gas industry continues to gain momentum despite continued market instability, producers are now ready to take advantage of the changing technology landscape to drive continued growth. New opportunities that leverage the Industrial Internet of Things (IIoT) and promote a digital workforce are suddenly pushing oil and gas companies to incorporate digital strategies into their capital projects and operational infrastructures. These companies are realizing more than ever the true value of digital transformation and how it can help them better adjust to a constantly changing industry and business landscape.

As a long-time automation solutions and technologies provider and partner to the oil and gas industry, Emerson Automation Solutions is prepared to help upstream oil and gas producers navigate this digital transformation and achieve Top Quartile performance, meeting project and operational standards of the top 25 percent of peer companies. Emerson has a deep understanding of these companies' automation needs and how they can leverage digital solutions to address most of the industry's critical trends. To emphasize this point, Emerson has identified six current trends in the upstream industry that can be impacted by digital transformation and potential solutions that can help facilitate that transformation.



**EMERSON™**

## TREND #

# 1

## Automated Production Optimization in Unconventional Plays

According to the USEIA, U.S. onshore production is expected to increase by more than 1 million barrels per day in 2019, primarily from unconventional plays. To meet production and capital efficiency goals, unconventional producers are looking to maximize field productivity through advanced solutions that optimize design and production operations. These require keen insight into oil field dynamics, which is why these producers look to new technologies that can consume large quantities of oilfield data, accurately predict well and field performance, and turn analyses into actionable intelligence.

One of these technologies, Emerson's Paradigm™ k, is a native cloud-based digital oilfield platform capable of monitoring, processing and interpreting large volumes of data in real time. This solution seamlessly connects live data from sensors to integrated reservoir-well-surface facility simulation and analytics, and through which anticipates events to enhance the operational efficiency of an entire oilfield while optimizing asset performance. In doing so, it enables enhanced situational awareness through virtual sensing and drives actionable decisions such as the need for optimal completion design, initiation of artificial lift for maximum production, automatic calibration of the subsurface, and continuous updating of optimal gas injection during the entire life of producing wells.

## TREND #

# 2

## Extending equipment life and availability to improve productivity

With the constant fluctuation in oil prices, producers remain focused on reducing their operational and maintenance costs to maintain profitability. Unscheduled downtime has caused process industries to lose more than \$20 billion in production annually and, according to the ARC Advisory Group, it could potentially cause companies to lose up to 5 percent of production. With so many production assets exposed to harsh and remote environments, it's no wonder more producers are integrating remote sensors with embedded diagnostics into their asset management systems. These technologies provide real-time visibility into equipment health and performance without placing personnel in hazardous areas. When the performance and health data is gathered, it is sent to central control where it is analyzed and processed to allow technicians to perform more efficient maintenance practices.

Sometimes, efforts to improve operations and increase uptime can involve a complex process of identifying, sourcing and integrating individual well pad operation solutions that not only capture readings from multiple data points but also provide comprehensive data analyses of equipment health and performance across the entire pad. Emerson's Digital Well Pad solution, for example, combines the benefits of an Automated Production Systems Surveillance (APS) solution with proven Asset Management Software (AMS) applications to remotely access every critical component at the well pad and easily evaluate performance. The APS system includes pre-engineered workflows to allow asset managers to map and facilitate an implementation path scaled to their specific business need and facility size.

## TREND #

# 3

## Adopting digital technologies to drive operational excellence

There is a movement throughout the oil and gas industry fostering widespread adoption and integration of equipment and systems that leverage the Industrial Internet of Things (IIoT) to enhance operational performance and drive profitable results. For upstream oil and gas operators, the need is more imperative due to the asset intensity of the industry, its remote operations and the hazardous environments in which its workers function. Achieving operational excellence in this sector, however, requires the rationalization of manual processes, integration of siloed decision support tools and updating of inefficient operational practices – and producers see digital transformation and automation as the key to this process.

Today, there are a host of digital and automation solutions available for oil and gas applications, ranging from pervasive sensing technologies and asset management software to intelligent flow meters and remote monitoring services. Several oil and gas companies are working with automation providers to not only digitalize their operations, but also change the way their workforce interacts with new technologies and processes across the entire company. This can include investment in a portfolio of digital solutions, like Emerson's Plantweb™ digital ecosystem, which offers an array of scalable and secure technologies, software and services that enable industrial digital transformation. With everything from innovative sensing technologies and advanced instrumentation to data analytics and services, these solutions are designed to help producers improve performance and achieve operational excellence by securely linking operational technology (OT) data to their existing information technology (IT) infrastructure.

TREND #

# 4

## Upskilling workforce to keep up with technology

The upskilling of workers to match the digitalization of industrial operations requires a significant investment in time and money, but it's become a necessity for oil and gas companies to stay competitive and profitable in the long term, and most producers are willing to take that step. Digitalization also is forcing oil and gas companies to take a more holistic view of personnel management, in which they are incorporating new training regimens into their personnel development plans to ensure workers can operate these new systems.

Because of the complexity of these newer technologies and software platforms, many producers are finding it easier to work directly with a third party to provide or develop applicable training programs online or onsite. Emerson, for instance, provides online classes and field education through its Educational Services program to foster a strong knowledge base on the full breadth of Emerson solutions and technologies. Often, these services can include customized training exercises with unbiased perspectives to help resolve specific issues. Most third-party services have their own training centers and online courses, but Emerson can also provide several interactive tools, like its new Performance Learning Platform, which provides a fully-instrumented, hands-on training experience in flow, level, pressure, and temperature measurement that can fit through a standard doorway.

TREND #

# 5

## Smart commissioning of new offshore facilities

As investment returns to offshore operations, the demand of E&P companies to design and engineer new facilities cheaper and faster is increasing dramatically. The need for continued capital and schedule flexibility in the engineering and construction of new offshore platforms has caused many of these companies to take a closer look at their project development approach and find new avenues of overcoming inefficiencies to more consistently avoid budget overruns and expedite time to first oil.

One of the more popular solutions to maximize budget and timeline flexibility is to incorporate smart technologies into the early development stages through a process known as "smart commissioning." Emerson's Smart Commissioning solutions integrate smart device management tools and electronic marshalling technology to streamline the entire commissioning process by reducing trips to the field, eliminating tasks and accommodating late project changes. When additional flexibility is required to address changing conditions or other factors that can affect construction, producers can leverage applications like Emerson's DeltaV™ digital twin solution to create a virtual simulation of a commissioned facility to test proposed design adjustments in real time without jeopardizing capital funds or construction resources. Engineers can then apply the learned knowledge to the final design and implement the changes before construction even begins.

TREND #

# 6

## De-manning of offshore facilities

Oil and gas producers in remote and hazardous locations must often strike a balance between ensuring expertise is retained where needed and keeping personnel out of harm's way, but with the advent of new automated technologies for remote operations, that balance is becoming easier to maintain. In fact, since the cost of manning offshore facilities is nearly three times what it is for onshore operations, companies are finding cost flexibility by integrating new de-manning solutions that still allow for effective asset monitoring while keeping the most critical personnel offshore.

Offshore producers now have access to an entire suite of solutions focused on centralizing expertise and connecting the right people to the right information remotely and safely. Emerson's DeltaV™ Mobile platform, for instance, combines smart device technology with real-time asset health and process control data to make operational intelligence available 24/7 from anywhere with an internet connection. This IIoT-based solution streamlines traditional workflows by enabling users to monitor operations and view critical data anytime from anywhere. Wireless sensors and smart devices are also foundational components of Emerson's Plantweb™ Insight and Plantweb™ Advisor applications that record onsite data automatically and transmit it to an administrative cloud system through an IIoT-based platform, which is then accessed from an onshore control center. This eliminates the need for offshore personnel to spend valuable time and potentially jeopardize their health and safety to obtain and record this data in hazardous conditions.

# Taking the next step



While Emerson's services and solutions can certainly help enhance production, reliability and safety for upstream oil and gas facilities, taking the first step toward digital transformation can be difficult without the proper guidance. Luckily, there are services available to point producers in the right direction and provide guidance along the way. Because digitalizing operations is neither a plug-and-play proposition nor a one-size-fits-all option for achieving Top Quartile performance, Emerson developed a consulting methodology that starts with

a clear business case and facilitates a digital transformation across an entire corporate and operational culture.

Emerson's Operational Certainty consulting practice is specifically designed to put producers on the right digital path for their operations by combining intuitive technologies and automated workflows to reduce complexity and empower more productive digital workers. By applying proven methodologies, Emerson's Operational Certainty consultants can help

producers develop a digital roadmap that empowers workers with higher-quality, faster decision-making capabilities to accelerate value creation. Beyond the enabling infrastructure, Operational Certainty consultants can also develop a thorough assessment of the organizational changes that are required for full realization of the benefits of digital transformation, ensuring best-in-class behaviors are adopted.

To learn more, visit [www.Emerson.com/OilandGas](http://www.Emerson.com/OilandGas).

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