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SCADA's Role in Today's Control Room

The Role Evolving SCADA Technologies and Effective Control Room Planning Play In Achieving More Efficient Field Operations

OILFIELD OPERATORS AND SERVICE COMPANIES have greatly changed the role that automation and remote monitoring can play in field operations by applying advances in technology. In turn, the role of a control room operator is evolving from that of a reactive monitoring function to one that can, and should, proactively spot developing situations and aid in addressing and solving problems before they reach a point that inhibits production or safety.

These advances come at a critical time, as increased public scrutiny of field operations is tightening reins on production in the U.S. These factors necessitate changing the way that remote monitoring and control systems are designed and implemented. Specifically, there are several technologies changing how control room operators function, and impacting the future vision of oilfield operations:

Wireless Instrumentation Systems

Wireless instrumentation systems are gaining wide acceptance for conveying operating data. Wireless systems are not embraced for safety systems, and should not be, but for operating data, wireless provides a cost-effective option to the traditional method of trenching landlines. A good rule of thumb: If more than 75 feet of trenching is necessary, wireless systems will typically be cheaper. Lower costs allow for more data points to be monitored and incorporated into SCADA systems. The more comprehensive the universe of data points being monitored, the greater the opportunity for control room "prognostics" (the proactive analysis of data and situations to drive actions).

Wireless systems also provide signal continuity. Traditional hardwired connections can be lost due to workover rig traffic, excavation incidents, flooding and the normal day-to-day operation of a site. Advances in battery life see many wireless systems running more than five years with no diminishment of power. Wireless systems also provide greater flexibility—they can be made secure and are easy to install and configure, yet can be easily dismantled and reassembled during workovers, giving better cost control and lower total lifecycle costs.

GIS/GPS Based Systems

GIS/GPS based systems have excellent field applications for tracking people and vehicles, which plays an important role in the constant pursuit towards improved safety. Control room operators can use GIS/GPS technology to dispatch operators in the field and monitor personnel. Controls can also be set with a "man down alarm"—sounding an alarm if a person or vehicle hasn't moved within a set amount of time. These systems are easily integrated into conventional SCADA systems, so data can be seamlessly monitored by control room operators. This type of functionality greatly expands the opportunities for the control room operator to positively impact the safety and welfare of personnel in the field.

Video Surveillance

There are three reasons to send a field operator to a site: for intervention in the normal operation of site equipment, confirmation of an alarm or data reading, or for security. Installing video at a site can accomplish some security and confirm readings, meaning that field operators need only visit a site when they have the potential to impact the operation.

A common objection to installing video is cost, but as technology has evolved, costs have been greatly reduced. Fully integrating video to the control room (as security, operational verification and to act as an historian to the events at the site) goes a long way towards justifying its expense, but video's role in risk reduction completes the job.

The most effective action a field operation can take to reduce accidents is to reduce the number of miles driven by field employees, or to reduce the number of dispatched trips to the field.

With IP-addressable video equipment with onboard servers, control room operators can access live feeds and assess whether a field operator needs to visit the site. Control rooms can even tie links to the operator alerting system, so operators with smartphones can access the video and see exactly what they're driving into.

LAN/WAN Network Design

As technologies advance, they add a significant bandwidth burden that must be considered during network design. As the need for bandwidth increases, network architecture and data path design become the foundation of a successful SCADA system. Polling on-demand, polling frequencies and alarm cry-outs all become critical factors in a successful system's infrastructure. These technological advances provide flexibility in system design. The more flexible and adaptable a tool becomes, the greater its utility to the user.

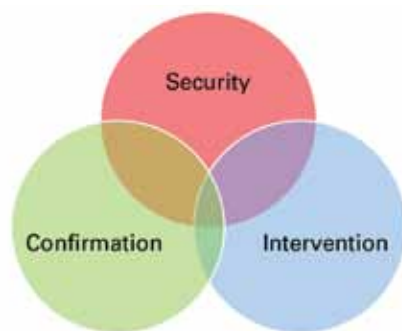


SCADA Systems

Newer and more flexible SCADA systems are designed for easy administration and operability (to add new screens on the fly) with onboard databases for trending and historizing, and are designed on platforms that easily integrate with other systems. Industry standard protocols such as OPC are becoming widespread and easily lend themselves to the intersection of data systems. The SCADA system is not a stand-alone application. To contribute the most value, SCADA systems must be integrated with hydrocarbon accounting, ERP, video and GIS/GPS technologies—the full suite of what makes for a successful field operation.

The impact that these technological advances have on the field's human resources is significant. The control room operator can evolve from being an observer (responsible for simple alarm response, data trending and report generation) to actively controlling the field through a dispatch mode of operation. Dispatching personnel based on need, rather than an arbitrary schedule, allows issues to be addressed in a proactive manner, preventing downtime while reducing drive time. Fewer staff can cover more assets and operate in a safer and more efficient mode – helping achieve the long promised goal of automation: to allow man to work more efficiently, pulling work out of the system.

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So Europe and the US are wrestling with mammoth legislation to tackle the perceived problems with derivatives trading, while economic growth remains sluggish, or even, in the case of some European countries, nonexistent. Asian giants China and India, meanwhile, have resumed their enviable economic growth rates, with their corresponding economic and political clout rising even faster.

This macro-economic story will be familiar to anyone in the oil industry, where "old world" markets have long been outshone by the boom economies of Asia. For years western oil majors have been battling the burden of legislation, planning regulations and long term exposure to clean-up costs. Both Europe and North America's refining sectors are under siege from new, state-of-the-art refining sites in Asia.

In the physical oil market, the response to this trend has been clear and seemingly irreversible, with the list of western refineries being permanently closed growing by the month and owners unable to sell unwanted plants, in stark contrast to the gleaming new refining kit being installed in places like Saudi Arabia and India.

In the global derivatives market, there is a lot less clarity. What is clear is that, no matter how hard Wall Street tries to water down legislation before it gets onto the statute books, the landscape is in the process of being altered for good. The future may look bright for the exchanges and clearing houses which stand to pick up some of the newly regulated trade, but for the market at large the outlook is a good deal more uncertain. **OGN**