
Digitally Streamline Manual Procedures & Automated Processes



Today, even in highly automated production environments, standard operating procedures (SOPs) for startup/shutdown, material loading/unloading, line switchovers, clean-in-place, maintenance preparation and other tasks are still completed manually, using paper-based systems.

Unfortunately, this creates a significant disconnect between equipment operators and the rest of the automated process. Manual SOPs are completed without coordination with existing control systems and information is not shared in real-time with Historians, LIMS, and enterprise-wide systems. When this is the case, process improvement directors, executives, and other key stakeholders are robbed of real-time

visibility into the production environment along with key analytics that could be used for process improvement.

“We have all these productivity tools that make us more efficient in our jobs, yet if you go into the manufacturing facilities of some of the biggest corporations in the world they are still using paper and pen to check off required procedures,” says Chris Kourliouros, VP Product Marketing of NovaTech’s Process Division which specializes in continuous control system architecture. “This creates a digital ‘blind spot’ in the organization because the worker and the existing systems are not connected and are not communicating with each other.”

But this isn't just a gap in the sharing of digital information. Paper-based SOPs that are inaccessible, poorly authored, not properly followed, not updated regularly, not based on best practices, not coordinated with control functions and not standardized across facilities can lead to severe consequences, including process interruptions, equipment damage and even injury.

Given the stakes – coupled with initiatives such as Industry 4.0 to further increase the level of automation at plants – many processors are now seeking ways to transform manual, paper-based SOPs into the interactive, digital documents that are fully integrated and synchronized with existing plant control and other enterprise computing systems. In doing so, processors expect a variety of benefits in plant safety, quality, and efficiency.

Safety, Quality, Better Data

When it comes to safety, eliminating the human error that can occur using paper-based SOPs is critical. According to ARC industry reports, human error is the primary cause in 42 percent of abnormal events, and a secondary contributing cause in over 65 percent of the cases. Human error causes more financial losses and unscheduled shutdowns or slowdowns than any other root cause. The financial losses stemming from a single incident can exceed \$75 million, according to professional services firm, Marsh & McLennan, to say nothing of the risks to plant personnel.

The digital approach enables plants to keep procedures clear, compliant, and up-to-date and reduces the likelihood that human error triggers abnormal events that could compromise worker safety. Digital, connected SOPs are also a more effective way to transfer industry know-how across generations and geography.

From a quality and efficiency perspective, ensuring operators carry out up-to-date SOPs also has a direct impact on process and product quality, while minimizing scrap, waste, and the need to troubleshoot.

A more integrated digital approach also allows top management access to superior analytics. Industrial analytics can not only help reduce costs but also drive future revenue growth when used to provide insight into upgrading existing products, changing the business model of existing products, and creating new business models.

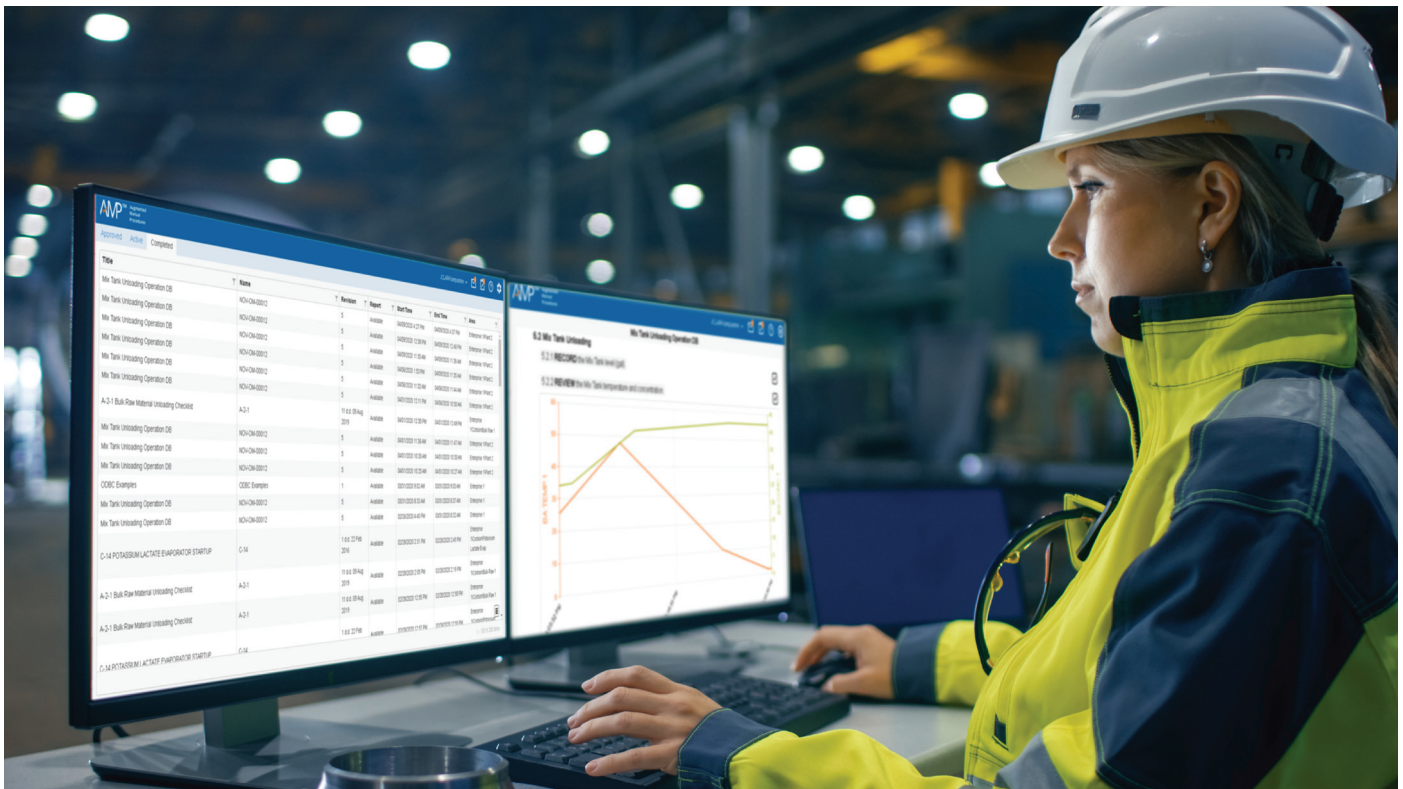
Digital Transformation of Manual Procedures

Although there are a number of products that can be used to generate digital SOPs and store them electronically (paper-on-glass), few have the interconnectivity to facilitate real-time interaction between the executing SOPs and the plant control system. Some DCS providers are also offering proprietary solutions, but digital SOPs should ideally be flexible, centralized and designed to communicate with any connected system.

A platform independent architecture utilizing open standards and protocols enables machines and operators to better collaborate. In this vein, the ability to execute procedures can make it possible to connect with key control systems to collect information and coordinate actions, embedding scripts can extend functionality with logic including accessing real-time information from other databases and systems. This approach provides an equipment operator with all the relevant information needed to complete work efficiently and can be easier and more intuitive to use.

One example is Augmented Manual Procedures (AMP) from NovaTech, a software that ensures accurate SOP execution, along with validation of manual tasks, and comprehensive information capture/sharing.

NovaTech AMP™ software converts paper-based SOPs into a digital format, capable of operating on a wide range of hardware such as smartphones, PCs, and tablets. The information is displayed as an operator-friendly checklist, and accessories such as bar coders or markers can be integrated. Completed tasks are self-



auditing and timestamped for future reference and compliance reporting.

In the field, manual procedures are linked via the operator's interface on a mobile or stationary device to the process control platform through software that enables bidirectional communication regarding equipment status and task completion.

“Once the SOPs are in a digital format, they are much easier to update, streamline, and standardize across the organization,” says Kourliouros.

“Too often, plant A does things one way and plant B another way, even when using the same machinery. There are so many variables and nuances that many large companies struggle to standardize procedures across multiple locations; they need tools where comments and other feedback loops can help track best practices to optimize operations and drive continuous improvements.”

One of the companies utilizing AMP is Praxair, a wholly-owned subsidiary of Linde plc, a leading industrial gas company in North and South America and one of the largest worldwide. The Fortune 300 company produces, sells and distributes atmospheric, process and specialty gases, and high-performance surface coatings from more than 800 plants worldwide, with thousands of smaller stations – each with its own unique SOPs.

According to NovaTech's Kourliouros, Praxair was looking to shed the load manually and physically from its operators and prevent potential problems during equipment startups and shutdowns, maintenance and complex operational rounds.

Among the challenges for Praxair, was that traditional offline SOPs made data inaccessible to analytics, which severely reduced corporate visibility into internal operations. Also, with traditional SOPs, there was no integration with the DCS, no rigid authentic and version control and no archival record-keeping “historian.”

According to Kourliouros, the company's Business Process Improvement team voiced concerns over two major "disconnects." They wanted to review procedures to identify ways to speed equipment startup; and they wanted facilities to share procedural information and learn best practices from one another, a task more easily accomplished in electronic format.

To do this, the Business Process Improvement team sought software with multimedia support in the field to provide access to images, video, QR codes etc. In addition, the team wanted to support portable or wearable devices, which will play an increasingly important role on factory floors of the future.

Finally, the company felt interconnecting manual work execution with process, batch and state-based control systems could provide an additional level of validation by automatically checking to see if certain required operations are performed.

For example, plant safety and efficiency can be improved by automating lower value monotonous tasks as well as critical tasks, such as ensuring a machine's valve is closed before moving forward to the next step. Because this approach communicates with the control system, it can prompt the control system to close the valve, providing a safeguard to human error and enabling operators to execute work in harmony with an automated control strategy.



For more information, visit the NovaTech website, www.novatechautomation.com or call (844) 668-2832.

