

Work Processes' Role in the Digital Oilfield

The digital oilfield has made strides, moving largely from a goal to being a reality. That is especially true in technology, where state-of-the-art SCADA and PLC systems are yielding a positive impact.

However, largely forgotten in this move into the digital age are the people and process elements of the oil and gas production environment.

One principle behind the mission of helping organizations turn data into actionable information involves defining and automating common field work processes. That is achieved by working with production asset operators and managers to define and document work processes using a “best practice” approach.

Automate Processes for Greater Efficiency in the Field

Definition, documentation and automation of work processes in the field can yield major benefits. Under the old model, field operators performed the tasks required to plan and drill a well based upon past experience, Excel spreadsheets and personal interaction. There was no real-time overview of the process, making the process difficult to manage. If one step in the process was delayed, the whole schedule was thrown off with little communication of the impacts to internal staff or external suppliers.

Automated work processes provide a defined process tailored to an individual asset way of working. Using state-of-the-art workflow engines, companies and asset managers can formalize work processes in unprecedented ways. Workflow tools can easily be integrated into an organization’s standard collaborative applications such as Microsoft SharePoint. Documenting and agreeing on the “approved solutions” for a workflow captures the knowledge that is in the heads of the ageing workforce, retaining it for younger operators.

Automating work processes can help:

- Streamline operations: All participants in a particular process help define their unique “best practices” for that specific process up-front
- Improve responsiveness by setting time limits and escalation paths for specific tasks
- Control risk by implementing standardized and measurable procedures
- Capture information throughout processes: Single entry of data flows with the process
- Improve decision making with more timely and complete information
- Increase visibility and manageability by rolling up multiple process tracks into Key Performance Indicator (KPI) executive dashboards
- Archive complete information from the work process upon process completion

Companies can also improve training via standardized processes. For example, in any well initiation process there are a number of roles and tasks that must be accomplished. The operations superintendent has overall responsibility for the operation, and supervises the setup coordinator, CAO administrator, hydrocarbon accounting administrator and asset & material administrator. Once the overall well initiation process is defined and systematized, training modules can be created for each task and role to enable management and team members to understand each job role and define performance expectations.

Leveraging Automated Workflows to Manage Field Project Activity

Under the old model, engineers, operators and technicians knew in their head how to begin a process and who was on either side of them in the path or sequence. Others might use Excel spreadsheets or Word documents to track their individual or departmental portions of a process. There was no visibility into the details or status of processes in progress.

Giving asset managers and operators the functionality they need is about providing accepted, documented and transparent work processes that are programmed into a workflow engine. That engine should automatically move tasks through the workflow, from role member to role member, and capture data along the way via single key entry.

Asset managers are typically responsible for managing many tasks and processes. Sometimes numerous processes occur simultaneously. KPI metrics and dashboard information can be beneficial for visualizing the status of each process in motion. Dashboard information for each process area can be integrated into SharePoint dashboards, so managers at each level of responsibility can look at the general status for each process, or can drill-down to more detail. The dashboard can indicate the overall status of a process by indicators such as red, yellow and green lights. The indicators change in real time as tasks are performed and processes proceed. For managers, dashboards deliver the capability to quickly scan and determine areas that require attention (those in a yellow or red status). The ability to broadly review, or closely investigate task and process bottlenecks is critical to helping managers meet project goals and control costs.

A common bottleneck example is the technician who is absent without notice, and is responsible for ordering permits and pipe for a new well. In the current environment this type of activity is scheduled and maintained by one individual using Microsoft Excel spreadsheets or Word documents. If the technician does not have a readily trained and available backup to immediately step in and perform the job, then the complete scheduling sequence for new well initiation begins to back up—affecting not only internal resources, but also external vendors and service providers.

In a scenario where new well initiation has been programmed into an automated workflow, monitoring and alerts are integral parts of the workflow. When the technician is absent unexpectedly, the technician's supervisor is automatically notified that a task or activity is overdue in a predetermined amount of time. The supervisor can then log into the workflow with the proper credentials to move the backlogged tasks forward. This keeps the process on planned schedule and ensures that internal resources and external vendors or service providers are on schedule and receive early warning of any schedule changes.

Another example of the inherent value of automated workflow is at the completion of the workflow. All data entered into the workflow is single entry and follows a standard form throughout the complete individual workflow process. At the point of completion of an individual workflow, all the data and information-related tasks, timing, installed equipment types and serial numbers, problems encountered during the process and other data services set up or integrated can be archived and turned over to production or another organization. This provides a history of all material and activity that occurred during the specific workflow, and also provides operations with a documented and searchable history of the life cycle of a specific individual process. Finally, because all the process information has been captured, a readily available audit trail exists if needed. This process capture helps mitigate loss of knowledge due to the aging workforce and archives data for reuse, training and analysis in the future.

Managing Executive Demands with Workflows

Executives responsible for managing multiple fields in different geographies are primarily concerned with meeting production goals (and thus, financial goals). These executives are also responsible for overseeing drilling programs, maintenance and work-over programs, regulatory adherence and reporting, responsiveness and efficient problem resolution, control of risks, and project and personnel health and well being.

Currently, these disparate types of data are mined from multiple sources. Information may not always be timely or accurate and is normally not available on a “real-time” basis.

However, automation has enabled data from many work processes to be aggregated and automated to feed into a high-level dashboard yielding a management level consolidated “birds-eye-view” of multiple field operations. The obvious advantage of the executive dashboard view is that it allows executives to deal with issues and problems on an exception basis. The executive does not need to interface with the asset managers if things are going well. Instead, she or he can focus attention on items that are out of tolerance shown by red or yellow indicators on the dashboard.

For executive management the real power of automated workflows is the new capability to visually tap into near real-time operations and financial metrics at-a-glance. Deploying technology infrastructure throughout a corporate enterprise delivers powerful new data points to the executive teams. For example, a vice president of production can have an executive dashboard built upon individual asset workflows and dashboards, providing him with customized dials, graphs, pie charts, or spider charts that give “cockpit” views of his total operations no matter where they are geographically.

These management dashboards can visually report on such operations as well planning and proposal, drilling programs, well initiation, maintenance and work-overs, and regulatory adherence and reporting processes. Executives have the capability to “drill down” into specific charts or graphs to see problem details as far down the workflow chain as they want to dive. Once the proper executive sponsorship and technical infrastructure are in place, almost any process that management wants defined and automated can be implemented at multiple locations and integrated into a roll up or hierarchical reporting framework and executive dashboard.

Organizations can achieve major benefits through definition, documentation and automation of work processes. Asset operators and managers can improve the operator's scheduling and work environment while at the same time presenting a global management view of the varied work processes ongoing at specific production assets. Automated workflows enable organizations to document asset-specific processes, capture knowledge, effectively monitor, and send alerts when required. Implementing automated workflows is the foundation of turning ad hoc data into actionable information.

Bruce Litwin is the Vice President of Digital Solutions for GloboLogix, a Houston-based oilfield services company that helps oil and gas companies achieve greater efficiency, productivity and accuracy in their oilfield operations by providing access not just to data, but to the right information at the right time. For more information, visit www.globlx.com.