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Improving pipeline safety with speed, efficiency and quality

*PwC's US Power and
Utilities Practice*

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The Pipeline Safety, Regulatory Certainty, and Job Creation Act of 2011, which amends Title 49 of the Code of Federal Regulations (CFR), is expected to accelerate and expand the scope of current gas pipeline safety enhancement efforts, resulting in much higher operational complexity. This means there will be a higher volume and faster pace of field work including valve repair, strength testing, in-line inspection (ILI), and pipeline replacement all occurring in parallel with records validation, interim pressure reduction and restoration, and on-going operational activities. In many utilities, for example, one or two hydrostatic tests are planned and implemented in a 12 to 18-month period. However, in an extreme case, a large west coast utility had to complete nearly 100 tests in just nine months.

This new operational reality creates serious planning and execution challenges for operators. Aggregating historical performance on much lower volume will not yield a reliable plan and budget, directly impacting rate making and cost recovery. The traditional process for executing “one-off” projects is not suitable for multi-phased, large scale programs. Based on PwC’s experience, operators must upgrade and reconfigure Planning, Cost Management, and Documentation Management processes, tools, accountabilities, and metrics, in order to achieve desired speed, efficiency and quality.

Integrated program planning: speed and reliability.

Having a feasible schedule in place early is the most critical step to get the program onto the right track and cadence. Developing an integrated execution plan for complex programs can take several months. Planning complexity is driven by the scale and pace of the work and the amount of concurrent constraints. PwC's integrated planning process starts with early definition of a clear scope of work, which is the basis for functional organizations to plan resource and work requirements. With baseline engineering drawings in place, the next step is to characterize the multitude of functional constraints, such as gas system reliability, environmental permitting, engineering complications, and resource constraints. Then, an iterative modeling approach needs to be deployed to derive a feasible execution schedule satisfying the key constraints. There needs to be ongoing coordination with records validation and integrity management to ensure resources are working on the most cost-effective scope that balances opportunity costs and risk assessments for manufacturing, construction, and mechanical damage. In addition, bundling construction activities across several work streams (strength testing + ILI + valve automation) will provide better resource and cost efficiencies.

Robust cost management: efficiency

Robust cost controls and processes throughout the project lifecycle, from planning through billing, are required to achieve efficiency without compromising speed and quality. PwC suggests operators focus on four levers. First, completeness and timeliness of engineering packages provides a foundation for materials management, environmental permitting, and construction planning. In addition, a rigorous bid management process combines the benefits of competitive pricing with productivity and cost efficiencies associated with bundled work. Proactive supplier performance management further strengthens operator relationships with contractors as both partners work to achieve cost savings through jointly developed value engineering and operational efficiencies. And lastly, deploying new technologies (such as the latest gel pipeline cleaning solutions) or preventative solutions (such as leak detection services) to accelerate time-intensive processes can achieve operational savings from reduced resource standby periods.

In many complex programs, construction and construction management work typically account for greater than 50% of total execution costs. PwC experience indicates 15-30% efficiency improvement potential as a result of effective deployment of cost management techniques.

Documentation management: quality

In the past, management of field documentation has been a low priority for many pipeline operators. But with the renewed focus on traceable, verifiable, and complete records, operators will need comprehensive quality management processes for as-built packages. While timely delivery of documentation from the field can be challenging, the ability to consistently present a complete as-built package that has been reviewed for quality and accuracy has proven to be nearly unachievable. PwC has found that a structured approach to as-built package management leverages the expertise of field engineers aligned with construction partners. By prioritizing package components and driving quality improvements into the field, operators can deliver reliable and accurate records to their planning, engineering, and mapping organizations.

Many gas utilities lack consistent delivery of field documentation, and for many construction projects, delivery of as-built packages from the field averaged well over a year. With the deployment of a structured package management and quality review process, PwC has helped clients achieve significant cycle time improvements for as-built packages.

Although the new regulatory requirements are challenging, they present an opportunity for pipeline operators to raise the operations game while enhancing pipeline safety. It will be an evolutionary journey. Operators who take a proactive approach to planning and executing the various safety enhancement programs will be advantageous in achieving objectives and aligning internal and external stakeholders.

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