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Is Technology the Solution?

By Chad Fletcher

Introduction

Regardless of whether or not we choose to acknowledge or accept it, the world in which we live is changing at an ever-increasing rate. The natural gas industry, while once somewhat protected from the winds of change, is now experiencing dramatic change, primarily as the result of regulatory forces including FERC deregulation and increased environmental and safety regulations. This rate of change will likely only accelerate through the turn of the new century as gas and electricity markets give rise to a fiercely competitive energy market. With a significantly aged asset base, less manpower and ever increasing competitive forces, how can the gas pipeline industry survive – and win?

The Gas Pipeline Industry of Today

After almost 40 years of conducting business in a relatively simple but confining environment, the structure of the natural gas industry began to change significantly in the 80's. This change can largely be attributed to deregulation via FERC Order 436, issued in 1985, through Order 636, issued in 1992. As a result, a more competitive business environment has been created and the focus has shifted to the end user / customer.

As with deregulation of any industry, a more competitive business environment demands improved operating performance in concert with lower operating costs. Specifically, demands on the operations of gas pipeline companies include improvements in efficiency, reliability and availability and minimization of risk in the areas of safety and the environment.

The natural gas pipeline industry in the U.S. has reached the half-century mark and its asset base has an average age of approximately thirty-five to forty years. Because of the era in which the majority of the industry's compression horsepower was installed, there is a significant number of small increment horsepower integral reciprocating units (1000 – 2500 HP), as well as a significant number of first generation aero-derivative and industrial frame gas turbines. While these older units suffer from poorer fuel efficiencies and higher operating costs, the economics of horsepower replacement on a large scale have yet to become favorable.

In addition to aging horsepower, much, if not the majority of the industry, has now undergone major re-engineering / downsizing / rightsizing efforts, the results of which have eliminated as much as 30 – 50% of total manpower. Significant experience and hands-on expertise have been lost in this process.

A recent survey concerning O&M costs of 28 of the major U.S. pipeline companies indicates that O&M costs increased at a rate of 6.5% per year over a ten year period

ending in 1994. Interviews with individuals at various of these companies has revealed that despite major capital improvement projects involving automation of compressor stations involving a large fraction of total facilities, measurable benefits on overall operating efficiencies have yet to be realized.

The Gas Pipeline Industry of the 21st Century

The natural gas industry in the 21st Century will face an even more challenging business environment, including deregulation of the electric utility industry via FERC Order 888 and the emergence of an energy market where energy options compete on a real-time continuous basis at the fingertips of the end-user. One only has to observe other deregulated industries to get a glimpse of what lies ahead: fierce competition, diminished customer loyalty, and continuously increased expectations for superior service at continuously decreasing prices.

Although prediction of environmental regulatory action is perhaps more speculative than gambling, it is generally accepted by most that requirements for emissions reduction and compliance monitoring will only increase over the next decade or two. Several issues already on the horizon include the following:

OTAG - 37 state region east of MS
    Estimated $1.5 Billion exposure
ICCR / MACT
    Estimated $800 Million exposure
Title V
    Estimated $500 Million exposure

[Could make the above a table]

With increased demands for lower operating costs and increased environmental pressures, replacement of horsepower will become more attractive and feasible, however, with approximately 10,000 IC engines and gas turbines (over 21 million horsepower), the makeup of the industry's compression horsepower will not change overnight. Using an estimate for replacement of $1000 / HP, the cost to replace just 50% of the industry's horsepower is over $10 billion.

Strategies for Survival and Success

From an operational perspective, success of the natural gas pipeline industry in the 21st century will demand more than just cost cutting, downsizing and even the implementation of new technology. It will require the successful implementation of a comprehensive strategy that leverages the potential power of technology with intellectual firepower and hands-on know how.

Contrary to "techno-hype", technology alone will not guarantee success. It must be accompanied by:

- Effective application based on knowledge and experience,
- Integration of various technologies into an overall system that effectively meets high standards of performance, reliability, etc.,
- Technical services to support and compliment technology, and
- Better trained users of technology (work force) to leverage capabilities and maximize the benefit.

The successful strategy will be dynamic in the sense that it will readily accommodate the changing environment, however, it will be focused on making technology serve the end user, not on being enslaved to it.

Technology's role must be to provide the means to:

- Significantly improve efficiency, reliability and availability
- Minimize environmental risk
- Continually optimize operation
- Leverage limited resources
- Support real-time decision making
- Provide prioritization of resources and tasks
- Do routine / mundane / repetitive tasks

In essence, technology must provide the "tools" for the industry to leapfrog to a higher plane of competitive performance. Because of the lack of driving forces in the regulated industry of old, technology development is lagging somewhat behind. However, with the pressures imposed by Clean Air regulations and the current force of increased competition, resources are being directed towards the development and application of technologies to meet the current and future needs of the industry. Even now, we can see promising signs of life in this area.

An important responsibility of the gas pipeline industry is to champion these development and application efforts. Consider that, even though the gas pipeline industry is comprised of hundreds of thousands of miles of pipe and over twenty million horsepower, the market for technology in any particular area is quite a small niche market.

A good example of this is the large-bore reciprocating engine population on which the industry now relies. There are approximately 8,000 of these engines in the industry, yet relatively few outside of the industry. Manufacture of many of the industry's makes and models have long since been abandoned by the OEM and very few of this type of engine are even being manufactured today.

While technology for these engines can draw on developments in other engine applications, a significant investment is typically required to effectively apply the technology. As with any business venture, however, a product must have an attractive and viable market or it will never experience success. In many cases, companies with

sought after technology are distracted by other more attractive markets than the pipeline market.

What is the answer? The pipeline industry must forge alliances with technology and service providers with the objective of bringing the needed “tools” to fruition. The results of this type of approach are real solutions to challenges and problems. Perhaps most attractive of all, the industry, as the customer, is actively involved in the process from defining the need through implementation of the end product. Sounds like a win-win!

The only certainty in all of this uncertainty is that time will not wait for the gas pipeline industry. Now is the time to evaluate the present, anticipate and plan for the future, roll up the shirtsleeves and go to work.