

Dutch Holland, David M. Pritchard, and Pradeep Anand

Seven Drilling Myths—Managing Successful Drilling Operations

At the very time when the energy industry could use a big improvement in drilling success, some say that drilling effectiveness has recently gone flat, even declined. As energy companies compete for limited capital with every other industry in the global village, ways to improve capital effectiveness (and therefore return on investment) are desperately needed.

Today's critical questions for many upstream energy companies are, "Why have we not seen continued improvement in our ability to plan, drill, and manage a well? Why, when many other industries seem to be forging ahead in productivity, hasn't our drilling competence made positive leaps? Why does each new venture seem to result in a 'new learning curve'? Why can't we sustain and replicate success?"

Realistically, the E&P industry is always looking for ways to "do it better," searching up and down the continuum to find particular spots that may indeed offer an opportunity to make further improvements. Currently, many are focusing on the drilling process itself, with many industry experts dissatisfied with progress being made in the drilling part of the E&P continuum.

Therefore, it's imperative for management to recognize that the failure to move ahead has three root causes that must be addressed in order to enable needed progress. Failure to address all three issues will leave the industry flat or declining in drilling competence and success.

1. Drilling myths abound and must be put to rest before companies can see and take advantage of new opportunities.

2. Technical competence must be returned to the planning room and the rig floor.

3. Active leadership and disciplined project management must become the order of the day for managing drilling operations.

Meanwhile, the industry has been inundated with new technology, "gee whiz" software, and countless new processes. Some of these processes have become cumbersome, and often when a process fails to deliver expected results, additional process steps are devised. The result is an extra-step, nonvalue-added, counterproductive process.

Debunking the Myths

To sustain successful drilling operations represented by world-class benchmarks, these myths first must be debunked.

1. All wells are different.

The greatest myth that the industry routinely hears: "This well was different." Yes, there are certainly no two wells the same in terms of lithology or pressure regimes. But it is critical to realize that engineering parameters that drive the design, planning, and execution of all operations are exactly the same—on any well, anywhere. In other words, the same Newtonian laws of physics apply to all operations. Therefore, all wells really are the same. Once this fundamental principle is applied to all design and execution criteria, chances for failure are significantly mitigated.

2. Drilling optimization is difficult to achieve.

Some have likened drilling optimization, or achieving the technical limit, to something that requires superhuman effort, even effort comparable to that of an athlete in attaining world-class status. Actually,

drilling the limit can be rather routine if sound fundamental engineering principles and best practices are applied.

3. Each new project represents a new learning curve.

Like a victim of the relentless force of nature, the industry is inundated with references to "lessons learned." While crucial to successful operations, many of the so-called lessons are ones that should have already been known and fully applied during first-well execution.

Moreover, many of these lessons become moot if projects are properly resourced, engineering principles are fully applied, and known best practices are adhered to. Any new project should have the beginning premise that lessons are transferable from other projects, even other regions. Then, if applied correctly, engineering principles strictly adhered to in planning and execution afford the opportunity to "jump-start" the learning curve.

4. Global, regional, and area expertise is not transferable, and new or different types of operations require specific high levels of expertise.

It is difficult to understand this phenomenon in which the industry shortchanges itself. It is often heard that a project requires specific high levels of expertise. This can be relegated to regional experience, such as "must have Gulf of Mexico experience," or type-of-well experience, such as "must have deepwater experience." Unfortunately, this presumption can sometimes be flawed and detrimental to a project.

What is really needed are individuals with different types of experiences. This allows for development of knowledge transfer. Along these lines, what companies should actually look for is the best individual for the job—the best engineer. If additional training is necessary (e.g., deepwater-riser management), then this specialized training is rather simple to add. A project should be resourced first with the best possible talent and proven experience.

5. There is no common process for drilling.

This also rings hollow since similar fundamental steps underlie all drilling efforts. Engineers appreciate relatively simple processes, concise applications, and simple process-management "process" schemes. In that regard, the well-delivery process is in itself simple, but it does require some fundamental steps, or stage gates.

6. Drilling engineers are excited about software or information technology (IT) tools.

Not so, even though drilling departments are continuously bombarded with new "gee whiz" software and gadgets. When the going gets tough, drilling engineers like to deal with familiar software and engineering calculators that do not require high degrees of IT expertise but do require high levels of application knowledge. There is a difference.

7. Drilling engineers do not expect strong leadership.

Successfully executing the stage-gated process that ensures successful delivery of a project requires a project-management platform and strong leadership (Fig. 1). Engineers expect and respect leadership, or ownership, that is fully accountable.

Preferable Approach to Managing Drilling Success

In summary, there are numerous reasons why myths permeate the industry. And unfortunately, the lower an organization is on the

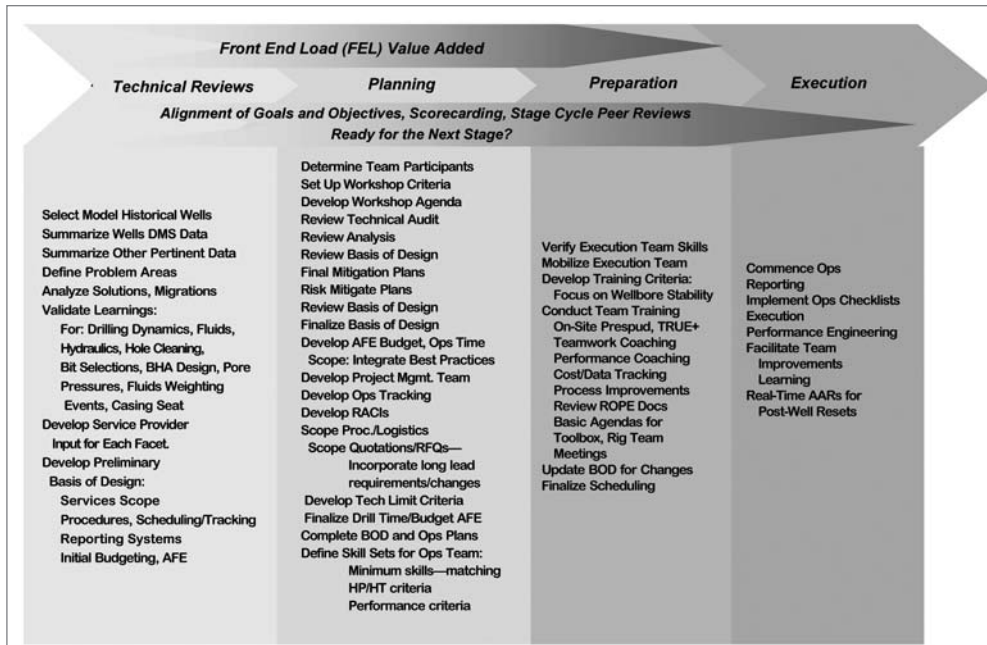


Fig. 1—Stage Gates for a Well-Delivery Process.

drilling success curve, the more the myths seem to permeate professional and managerial communications. Companies must get by the myths to get at the improvement of drilling success. When company management moves beyond the myths to reality and begins to address the potential for improving drilling success, two critical success factors stand out. Two key areas must be improved simultaneously for material gain in drilling competence and success:

Technical Approach × Leadership/Project Management = Success.

Key One: Jump-Starting the Learning Curve With the Triangle of Success

Improvement in the technical approaches used in drilling must happen first. Successful drilling operations can be depicted by a Triangle

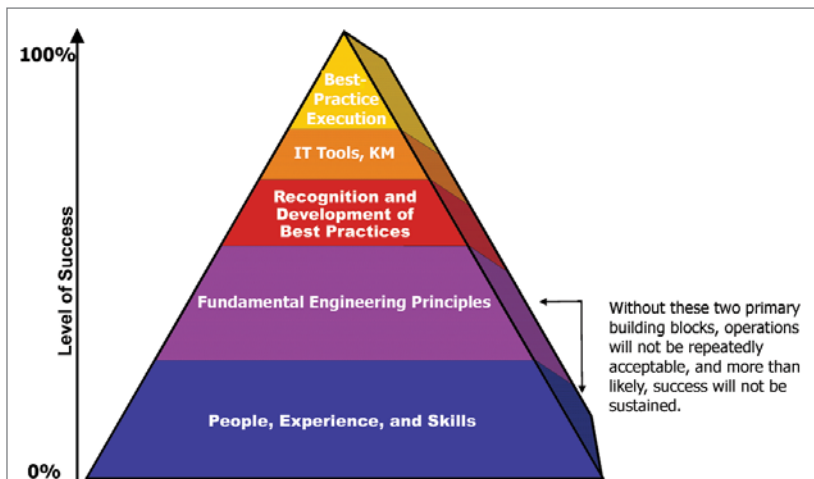


Fig. 2—The Triangle of Success.

of Success rooted in people’s expertise in using engineering fundamentals (Fig. 2).

- **Expertise.** The foundation of the Triangle of Success is based on “been there, done that” expertise with the critical knowledge and skills for drilling success.

- **Engineering Principles.** To achieve and sustain rapid learning, fundamental engineering principles of the drilling process must be adhered to: analysis, planning, execution, reset, and sustainability.

- **Best Practices.** The mid-section of the Triangle of Success is based on the best practices of the industry—across regions, across projects, and across drilling professionals.

- **Solid IT.** Tools that work, that can be used simply, and that support the drilling practices and thought processes are

key—not too much and not too little, but certainly not favoring “bells and whistles” over usability.

- **Flawless Execution.** Talking and thinking a good game are great. But nothing counts until companies bring flawless, disciplined execution to each and every step on each and every drilling project.

Key Two: Active Leadership Through Disciplined Project Management

The second key for improvement of drilling is strong, active leadership through disciplined project management. Disciplined, detailed, professional project management is now an accepted standard for most large construction or IT projects. However, it is not unusual to see “informal project management on the back of an envelope” as the rule in the management of drilling.

In fact, Independent Project Analysis Inc. (IPA) maintains that there is no evidence from the whole-asset perspective that projects are managed any more successfully today than they have been in the past. IPA suggests that less than 5% of projects actually meet project managers’ main objectives of delivering a successful outcome within budget and on time. And the trend line appears to be down, not up (Fig. 3).

Disciplined project management, responsible directly to the asset leader/decision maker, ensures that the project team and resources support the Triangle of Success previously discussed. Project management in a given company can be “immature,” dependent on heroic action by a few key people, or “mature,” with process-management processes, best practices, and the professional discipline called for by what is at stake for the business.

The Bottom Line: Achieving Improved Well-Management Performance

Fig. 4 shows a “before” the first well and an “after” the next two wells. Between wells one and two,

active leadership and disciplined project management were added to the company's process for drilling management. The leadership addition focused on getting sound engineering expertise into play in both well planning and execution while de-emphasizing compromise decision making that kept everybody on the drilling team happy. And the results speak for themselves.

How should E&P companies launch the drilling improvement process? Three steps are highly recommended. First, companies should examine the seven industrywide drilling myths and determine which apply to them. Or is the company enmeshed in its own unique myths (and what are they) that prevent it from making significant improvements and leveraging often huge drilling opportunities?

Second, companies should set a specific aggressive goal for improving drilling operations. In this context, aggressive should mean goals that some within the company believe are not attainable (a "stretch" goal to make everyone visualize going the proverbial extra mile).

Third, meeting goals must rely on getting back to basics. In fact, two big opportunity areas are not being as aggressively pursued as

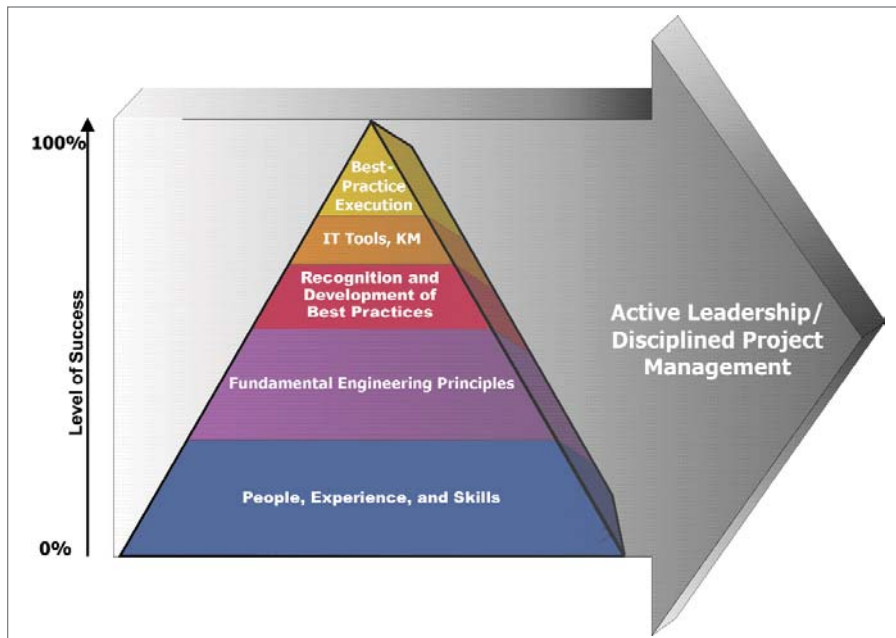


Fig. 3—Disciplined project management supports the Triangle of Success.

they should be. One is the focus on the basic engineering and science around drilling, as noted in the Triangle. The other, as noted, is really focusing on a more systematic and disciplined project management.

With continually advancing technological processes, the industry will always be presented with opportunities to "do it better" than the preceding generation. Therefore, decision makers must be open to new ways to improve drilling success or, like the dying patient on the operating table, the vital signs will flatline.

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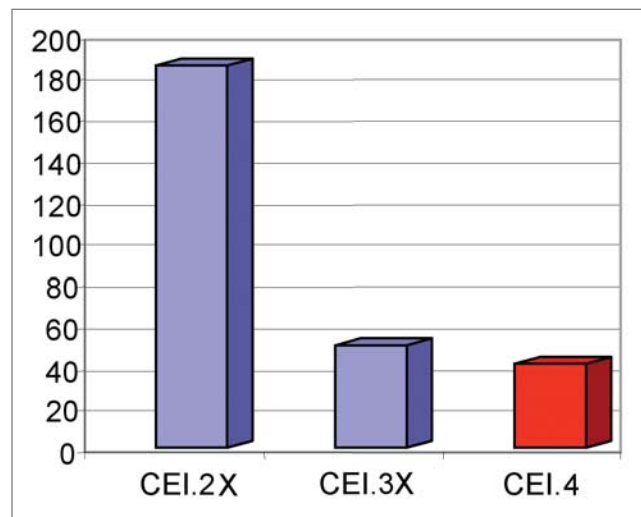


Fig. 4—Number of days to 18,000 ft.

Dutch Holland is founder and CEO of Holland & Davis LLC. He holds a PhD degree in Management, Statistics, and Operations Research from the U. of Texas at Austin. **David M. Pritchard**, SPE, is President of Successful Energy Practices Intl. He holds a BS degree in petroleum engineering from the U. of Tulsa. **Pradeep Anand**, SPE, is President of Seeta Resources. He holds a BS degree in metallurgical engineering from the Indian Inst. of Technology in Bombay and an MBA degree from the U. of Houston.