



# White Paper

## Managing Successful Drilling Operations

### The Triangle of Success

#### The Need for Improvement in Drilling Success

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

Today's critical questions for many energy upstream 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?'", and "How come we cannot sustain and replicate success?"

We believe that the failure to move ahead has three root causes ... that must be addressed in order to enable needed progress:

1. **Drilling myths abound and must be put to rest** before we can see and take advantage of new opportunities
2. **Robust Engineering 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.

Failure to address all three issues will leave the industry flat or declining in drilling competence and success.

In the last few years 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, then additional process steps are devised. The result is an extra-step, non-value-added process that is counterproductive.

#### The Myths of Drilling Operations:

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Myths abound and prevent us from seeing the opportunities to do things better. A sample of myths alive and well in many

parts of the industry are as follows:

1. All wells are different
2. Drilling optimization or Technical Limit is difficult to achieve
3. Each new project requires a new learning curve
4. Global, Regional and Area expertise is not transferable, and new or different types of operations require specific high levels of expertise
5. There is no common process for drilling
6. Drilling engineers are excited about software and IT tools
7. Drilling engineers do not expect strong leadership

In order to sustain successful drilling operations represented by world class bench marks, we must first begin to debunk the myths.

#### Debunking the Myths

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##### 1. All wells are different

Sure they are. The greatest myth that the industry routinely hears: "This well was different". While there are certainly no two wells the same as far as lithology, or pressure regimes, it is critical to realize that engineering parameters which drive the design, planning, and execution of all operations are exactly the same – any well, anywhere. In other words, the same Newtonian laws of physics apply to all operations. In this regard, therefore all wells really are the same. Once their fundamental principles are applied to all design and execution criteria, chances for failure are significantly mitigated.

##### 2. Drilling optimization or Technical Limit is difficult to achieve

Some have likened drilling optimization, or achieving the Technical Limit, to something that requires super-human efforts, even efforts comparable to that of an athlete in attaining world class status<sup>1</sup>. The fact is that drilling the limit can be rather routine if sound fundamental engineering principles and best practices are systematically applied.

### 3. Each new project requires a new learning curve

The industry is inundated with references to “lessons learned.” While they are crucial to successful operations, the fact is that many of the so-called lessons are ones that should have already been known and fully applied during first-well execution. In fact, 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, and that 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.

The industry short-changes itself; it is difficult to understand this phenomena. We often hear 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. 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. What we are really looking for is the best individual for the job – the best engineer. If additional training, for example ... deepwater riser management is necessary, then this specialized training is rather simple to add to an engineer’s repertoire. A project should be first resourced with the best possible talent and proven experience.

### 5. There is no common process for drilling

While the myth is that there is no common process for drilling, the truth is that 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 does require some fundamental steps, or stage gates. An example of a stage gated process is depicted below.

### 6. Drilling engineers are excited about software, or IT tools

Not so! Drilling departments are continuously bombarded with new “gee-whiz” software and gadgets. But when the going gets tough, drilling engineers like to deal with familiar software, and engineering calculations 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

To successfully execute the stage gated process to ensure successful delivery of a project requires a Project Management platform, and strong leadership. Engineers expect and respect leadership, or ownership that is fully accountable.

In summary, there are numerous reasons why myths permeate the industry. And unfortunately, the lower an organization is on the drilling success curve, the more the myths seem to permeate professional and managed communications. We must “get by the myths” to get at the improvement of Drilling Success!

## Our Approach to Managing Drilling Success

When you move beyond the myths to the reality and begin to address the potential for improving drilling success, two critical success factors stand out.

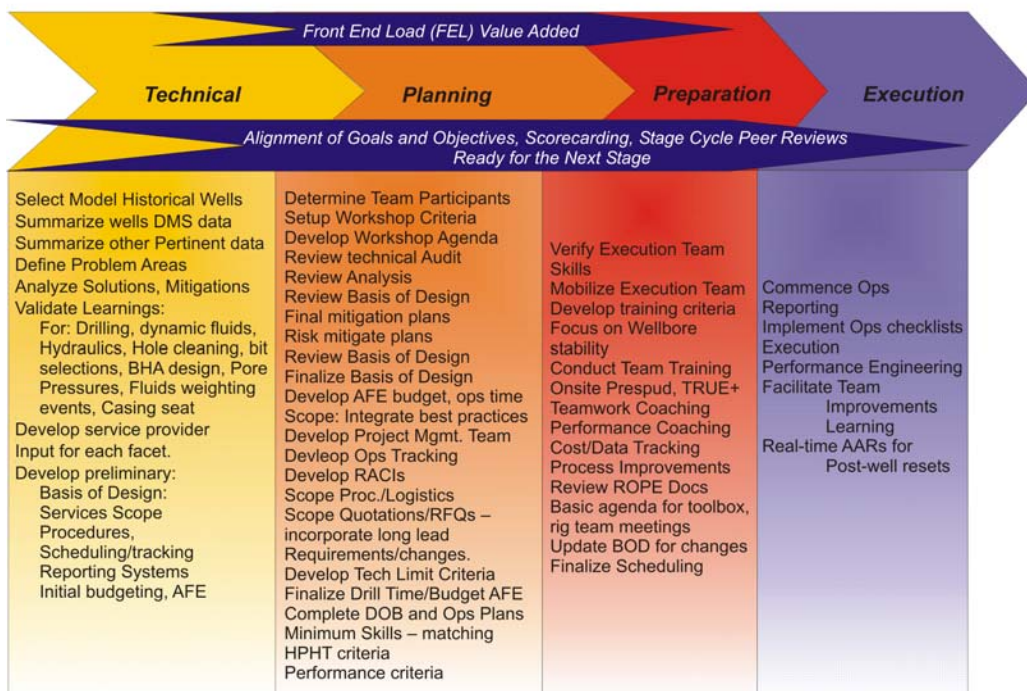
Based on our years of experience, we see two KEY areas that must be improved simultaneously for material gain in drilling competence and success:

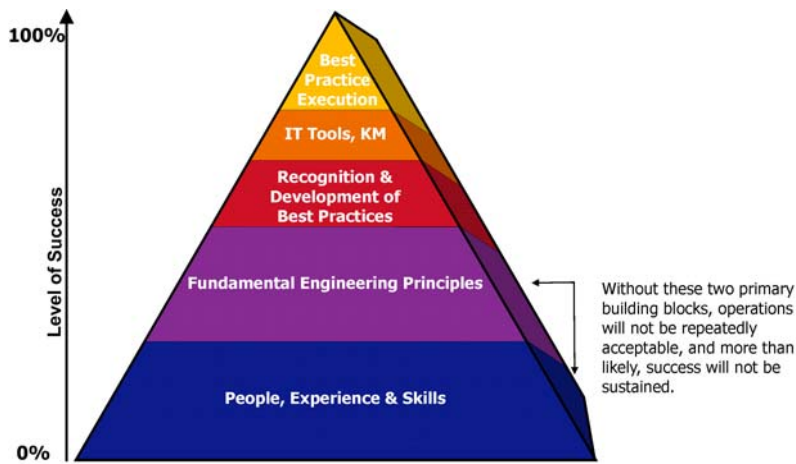
- **Technical Approach**
- **Leadership/Project Management**

### KEY ONE: Jump Starting the Learning Curve with The Triangle of Success

Improvement of the technical approaches used in drilling must happen first. Successful drilling operations can be depicted by a Triangle of Success rooted in people’s expertise, using engineering fundamentals:

Stage Gates for a well Delivery Process





**The Triangle of Success**

- **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** ... In order 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 midsection of the Triangle of Success is based on the best practices of the industry ... across regions, across projects, and across drilling professionals.
- **Solid IT** ... IT tools that work, that can be used simply, 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 we 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 information technology 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.

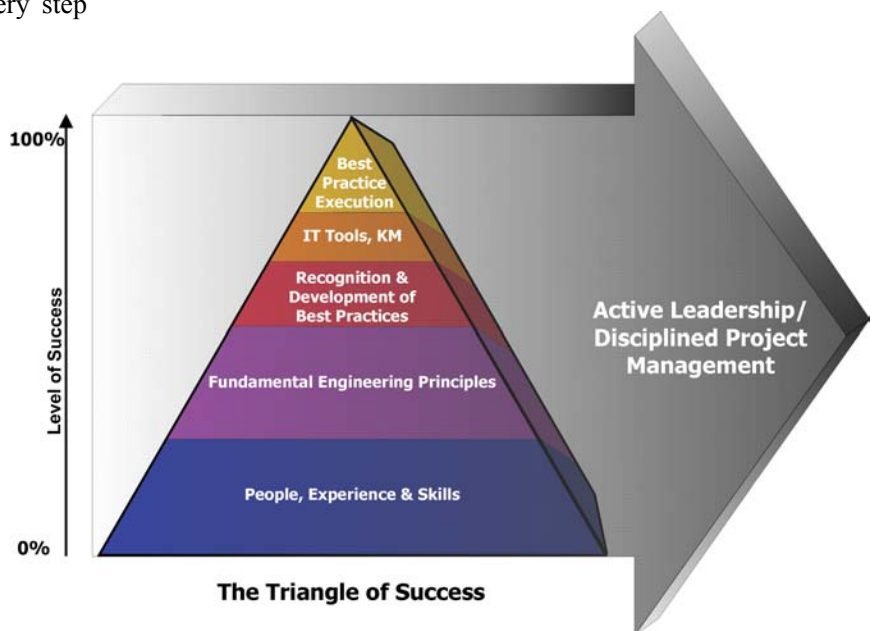
In fact, Independent Project Analysis Inc. maintains that there is no evidence from the whole asset perspective that projects are managed any more successfully today than they have been in the past. They suggest that less than five per cent of projects

actually meet project managers' main objectives of delivering a successful outcome within budget and on time. And our view is that the trend line is down, not up!

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. Key to predicting the performance of a company's project management practices is the idea of “capability – maturity.” Project Management in a given company can be “immature”... i.e., dependent on heroic action by a few key folks or “mature” with Project Management processes, best practices, and the professional discipline called for by what is at stake for the business.

## The Services We Offer

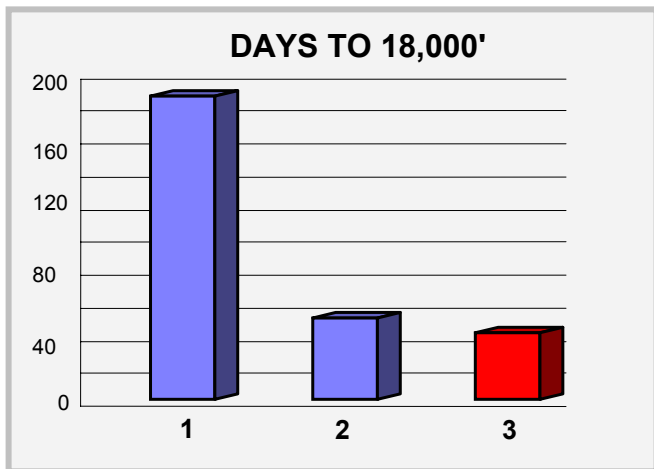
1. **Diagnostic Services** ...based on Project/Portfolio Forensics
  - a. Identification of Drilling and Management strengths and assets
  - b. Identification of management and technical limits to be overcome to move drilling performance to the next level
  - c. Develop concrete actions and business case to move to next level of performance
2. **Design Services** ...Identifying the best practices in both drilling and Project Management needed to move drilling performance to the next level
  - a. Process design for management of drilling
  - b. Project Management system design
  - c. Identification of competencies required for success
  - d. Develop master implementation plan to put drilling processes / practices and Project Management into play



3. **Execution / Implementation Services** ... to ensure that best drilling and project management practices are put into day-to-day operation
- Complete Program/Project Management to end state
  - New process and technology deployment
  - Operations Integration (expectations, training, contracting)

### The Bottom Line: Improved Well Management Performance

The figure below shows a “before,” the first well, as well as the “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. Active Leadership put 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!



### Powerful Resources for Improving Drilling Management

- **Successful Energy Practices International ("SEPI")** ... specializes in the determination and development of Successful Practices for drilling, well construction, and full life cycle production

operations. SEPI professionals represent exceptional experience and stand shoulder to shoulder with energy company managers to improve drilling operations through the recommendation and implementation of Drilling Practices that work.

SEPI Provides:

- ◇ Upstream Contract Personnel for the Planning and Engineering Phases of Drilling and Production Operations
- ◇ Project Management Personnel
- ◇ Wellsite Supervisory Personnel, Drilling Consultants
- ◇ Service Company Engineering Specialists, Coordinators, Well Site Specialists
- ◇ Technical Audits and Review
- ◇ Rig Operations Checklist Development, Drilling Manual Development
- ◇ Successful Practice Studies and Reports
- ◇ Technical Limit Development
- ◇ Logistics and Implementation, Management Assays and Personnel for International Operations.
- ◇ Well Delivery Processes, Organizational Learning Criteria

- **Holland & Davis LLC** ... has been a proven vendor to industry and government for more than 30 years, focusing on the problems and challenges of Program and Project Management applied to Big Change ... like implementing large IT systems or running major capital projects. Our team members average more than 20 years of business experience that is directly applicable to the services we provide.

Holland & Davis delivers exceptional business results at the lowest cost of service. We deploy fewer, yet more experienced consultants for each project, utilizing “client teams” to perform much of the work. Our approach facilitates the effective transfer of knowledge as well as buy-in to the solutions we provide for the client organization. Holland & Davis focuses on all the key steps required to improve Project Management and to make results happen ... on target, on time, and on budget.

### Next Step

Let us help you achieve your drilling management goals.

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