



## **Current Risk Management Issues in the Oil & Gas Industry**

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By

**Dr. Kris R. Nielsen<sup>1</sup>**

Chairman and President, Pegasus Global Holdings, Inc.

Long term growth in projected CAPEX for upstream projects and downstream projects by Owner/Operators (Integrated Oil Companies or National Oil Companies) in light of sustained global demand and pricing projections has fueled much discussion over the last three years and continues to make the exploration and production a hot investment area. There is no slackening in future demand, but there is a flattening of CAPEX budgets in respect to the medium term (the next two to three years especially) because many current projects are behind schedule and costs have dramatically increased. Thus, in 2007 these cost and schedule pressures are causing many Owner/Operators to extend planned release dates for announced projects, especially in West Africa, Central and East Asia, Australia, and South America. We currently are seeing signs from our engagements that the upstream CAPEX project delays and cost increases are also hampering expected growth in the downstream CAPEX projects as well, because Owner/Operators do not want to subject planned projects to similar cost and time issues, and their CAPEX budget reserves are being consumed by the cost and schedule overruns with the current projects.

On the other hand, Services Sector companies (E&C Contractors, Specialty Contractors, etc.) in 2006 touted CAPEX trends as translating into sharp growth in order backlogs and claimed as a result that they were an attractive investment opportunity. In fact, the Services Sector companies were very emphatic about their prospects because the percentage of so-called “quality contracts” reflected in backlog was rising, that is, more contracts were “cost reimbursable” or “unit price” rather than “fixed price or lump sum.” Last year at the Deutsche Bank Oil & Gas Conference many Services Sector companies loudly proclaimed the tough times that were plaguing many lump sum contracts for the first four years of this decade were a thing of the past. Management was more focused on proper “Risk Management” and “Contract Administration” as a result of the hard lessons learned from inadequacies in their performance on lump sum contracts. E&C Contractor companies in particular said they had plans in place to

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<sup>1</sup> Dr. Nielsen is Chairman and President, Pegasus Global Holdings, Inc. and can be reached by e-mail at [k.nielsen@pegasus-global.com](mailto:k.nielsen@pegasus-global.com).

handle “emerging global resource shortages” as well as the “company institutional knowledge” among project personnel issues that I had suggested were current problems. In 2007 the Services Sector is being more cautious in their predictions, blaming the flattening of CAPEX budgets. Again from our current engagement experience, however, we also are seeing signs that the Services Sector companies are experiencing potential margin reductions from the same issues they had in the past with project execution, including in the performance of the “quality contracts.” Although in some global regions CAPEX growth is being fueled by non-traditional Owner/Operators, that is, by companies that are not IOC’s or NOC’s.

As I also concluded last year, our recent experience and recent trends within the oil & gas industry indicated to us that executing projects is going to be more difficult and more risky in the future. In the future understanding execution risks will be critical for both Owner/Operators and Services Sector companies alike to be successful. For all stakeholders in the Oil & Gas industry there are indeed continuing opportunities, but ones that require constant vigilance of the risks. Performance and investment requires more than perceptions of risk management, there must be real demonstration and commitment to risk management practices. The opportunities for all stakeholders will be short lived unless the Services Sector companies can assure their execution of projects will not be a repeat of issues that they had a few short years ago.

### Introduction

Working with many Investors, Owner/Operators, and E&C Contractors, I have observed that there is considerable confusion and understanding about what “contract backlog” really means and how revenue is recognized from that backlog. Everyone thinks that “they” understand – at least from a generally accepted accounting principles perspective. The confusion may be the result of many factors, but I believe the real reason is that the statistical presentation of financial data and presentations (oral or written) of what the financial data really means assumes reasonably consistent definitions and consistent usage between all stakeholders. Such definition and usage consistency, however, is not a reality. In addition, there is an inconsistency as well between the internal operations personnel and internal financial personnel of various Investors, Owner/Operators, and Services Sector companies that complicates matters even more.

I do not pretend to have all the answers. Since this conference affords the opportunity for representatives of the three groups of stakeholders to come together to talk about company-specific and industry-specific factors, future trends and management decisions that are relevant to investment in companies, I will attempt to give some perspective at the very least. It is a fact that one of the largest current company-wide execution risks and also project execution risks is this inconsistency. The issue is one of concern to Owner/Operators with respect to their CAPEX planning and budgets. It is also of concern to Services Sector companies currently because of the perception that their “quality contract” backlog additions have eroding margins just like Lump Sum Turn Key, Engineer-Procure-Construct contracts of the past. For Investors, project timing concerns and potentially eroding project margins are obviously of interest. Thus my main focus will be on this risk issue and its management.

### Definitional Perspective

Let us begin with the concept of Risk and the definition with respect to engineering and construction. Risk typically is defined as a potential condition, element, event or factor arising during project execution which inhibits or negates the achievement of stated project function, scope, cost, schedule, or quality goals. Project Risk Management is composed of systematic processes by which Risk may be identified, evaluated and avoided, and mitigated or eliminated, in order to preserve the achievement of project’s goals. Therefore, for engineered and constructed projects, Project Risk Management is a systematic program by which a party to a

project identifies, evaluates, and acts to avoid, mitigate or eliminate risk elements or factors which threaten the successful achievement of the project's goals.

Owners and Contractors have particular and unique positions relative to the risk elements of every engineering and construction project. In effect, there are two types of Risk Management for risks once identified:

- Traditional Insurance Risk Management, which is concerned with the management of the party's insurance program (i.e., hazard insurance, liability insurance, etc.). The risks covered are usually catastrophic.
- Execution Risk Management, which is concerned with the management of specific events or conditions which may inhibit or prevent the achievement of project goals and cannot be insured. The risks covered are project performance related.

With regard to either type of risk, a fundamental principle is that Risk Allocation from the perspectives of Owners and Contractors is one of predictability. This concept may appear odd at first, but risk in engineering and construction requires a sense of predictability so that the parties know how to react and manage the risks that they face. For the Oil & Gas industry today projects are risky. We are pushing the technology envelope, and executing projects in increasing deep water and frontier areas. Owner/Operators want to receive a completed project that meets the desired function, in a defined timeframe, and within an acceptable cost. Their interest is the actual use of the project. Services Sector firms take on the mission of executing a project so that it may be used and useful. But all of us know that engineered and constructed projects seldom meet exactly what either group expected at the beginning of the project. Especially in the Oil & Gas industry, a perfectly engineered and constructed project as it was planned does not exist. The one certainty is that all the planned conditions also will not be as expected. What both parties require, however, is a predictable pattern as to "who" has the consequences "commercially" when risks arise, as they always do. Since a contract is the primary means of providing such predictability, the contract must allocate the risks between the parties. The various contract types (for example, lump sum, unit price, and cost reimbursable) are meant to properly allocate these project risks commercially in a predictable manner. A guide that I often use is illustrated by the following Table. The Table describes various project execution conditions and contexts, and provides a predictable understanding for both Owner/Operators and Services Sector companies.

<b>PROJECT EXECUTION CONDITIONS AND CONTEXT EXPECTATIONS</b>					
<b>Project Delivery System and Contract Type Expectations</b>					
	<b>Delivery System</b>		<b>Contract Type</b>		
	<b>Separate Engineering Construction</b>	<b>EPC</b>	<b>Lump Sum</b>	<b>Unit Price</b>	<b>Cost Reimbursable</b>
<b>Owner Considerations and Requirements</b>					
Cost Control is Major Consideration		✓	✓		
Owner to Control Contingency	✓	✓			✓
Bid Competition Required	✓	✓	✓	✓	
Maximum Owner Involvement	✓				✓
Minimum Owner Involvement		✓	✓		

PROJECT EXECUTION CONDITIONS AND CONTEXT EXPECTATIONS					
Project Delivery System and Contract Type Expectations					
	Delivery System		Contract Type		
	Separate Engineering Construction	EPC	Lump Sum	Unit Price	Cost Reimbursable
Owner Has Minimal Oversight Capabilities		✓	✓		
Single Source Responsibility		✓	✓	✓	✓
Contractor Provides Project Funding		✓	✓		
Project Scope and Parameters					
Clear Scope Definition	✓	✓	✓		
Minimal Scope Definition	✓				✓
Scope/Complexity Defined, Quantities Uncertain	✓			✓	
Minimal Scope Changes Expected	✓	✓	✓		
Potential for Large Scope Changes	✓			✓	✓
Tight Schedule		✓	✓	✓	✓
Volatile Project Environment	✓	✓			✓
Stable Project Environment	✓	✓	✓		
Large Complex Project	✓	✓	✓	✓	
Primarily New Technology	✓	✓			✓

Predictability is important. No matter what legal system on which a contract is based, the almost universal basis of contracts in the global markets is one of “mutual mistrust.” What is meant by “mutual mistrust,” for example, is that the Owners believe that Contractors inherently will try and execute and deliver something less than that for which is obligated; for example, the Contractor will provide less scope or quality and/or take longer. Contractors believe that owners will demand more than the contractor has agreed to execute and deliver; that is, the owner wants more scope or quality and/or delivery in less time. Therefore, owners and contractors believe that each must protect or defend the benefit of the “bargain” to which it believes the parties agreed. For Owner and Contractor alike, they both believe there is not anyone with more interest and in a better position to do so than itself. Thus, when one party believes it has been injured or damaged, the injured party has an obligation to the offending party to give reasonable notices of its failure or the presumed failure to “live up to the bargain.” Parenthetically, these functions are performed by the project management teams, specifically the contract administration and project controls personnel of both Owners and Contractors. Therefore, the predictability that comes from common usage of the type of project delivery system and contract type enables users of such contracts to become familiar with the processes and skill sets which enable parties to function under terms that are familiar. It forces parties, whether an Owner or Contractor, to behave in an expected manner. Where there are variances from that bargain reached, parties also have defined a process to resolve their different understandings.

#### Booking of Backlog, the Role of Contingency, Revenue Recognition

For Services Sector companies (E&C Contractors), the booking of a project into their backlog is assumed to be consistent under any of the above project delivery methods and contract types.

Conventional wisdom is that booking is the initial value of the contract, that is, the fixed price, the given quantities (times the unit prices), or the amount of expected costs plus fees. Project delivery method, contract type and risks of misunderstanding, however, come into focus at a more fundamental level. First, there are misunderstandings relative to what costs are actually included in the estimates that give rise to the value. Second, misunderstandings occur as a Contractor recognizes revenue from execution of the project contract, risks start to emerge, and significant variations or changes occur.

With respect to the first issue, risk from the E&C Contractor perspective is managed in many ways. Two methods, however, are universally employed: the inclusion of a Contingency in the estimated costs for conditions or situations which are “knowns” and a “Management Reserve” for “known unknowns” which is not included in estimated costs. Contingency is an amount that must be added by the E&C Contractor to account explicitly or implicitly for “knowns,” i.e., for those risks which are likely to occur but cannot be specifically identified at the time the estimate is prepared. Contingency thus is amounts added to the estimate to allow for providing things that experience shows will likely be required, and are therefore, part of the total estimated cost (not an extra), and conditions arising during the execution of the project which could not be specifically priced, foreseen or anticipated. Contingency is typically managed by the “Project Manager” and the amount is established by issues, such as, design definition level, estimating methodology, time frame and the probability of meeting the required schedule, whether the project involves new or emerging technology, remoteness of job site, infrastructure requirements, engineering physical progress, degree of equipment and material commitment, etc. Management Reserve is an amount that the E&C Contractor management, rather than the project, establishes to cover for execution performance risks that may arise from “known unknowns” and is an amount that is not included in the estimated project cost. These “known unknowns” are risks that are neither explicit nor normally expected, i.e., risks that are typically discrete events which have a low frequency of occurrence and a high severity of impact, such as, shortages of trained contract administration/project controls personnel, shortages of resources, technology failures, etc.

The manner in which different E&C Contractors and between different project teams within the same company quantify risk into contingency is significant for different project delivery methods and contract types. The difference in booking Lump Sum Contracts and Cost Reimbursable Contracts can be summed up in how the E&C Contractor evaluates Contingency. In a Lump Sum bid the Contingency is included in the booked backlog, and may or may not increase the margin that is realized at completion of the project. For example, if the risks included in the Contingency do not emerge, margin is increased. On the other hand, if risks were not properly and adequate estimated, margins at completion will be less, such as, when project execution delays occur. Recently, our engagements have found of particular significance is the issue of treating subcontractor costs in estimates. Let me explain. An Owner/Operator's use of prescriptive specifications is tantamount to saying that this is what the Owner/Operator wants and expects. The E&C Contractor only has risk associated with its execution of exactly what is called for in the contract documents. In other words, the E&C Contractor's duty is to conduct a reasonably prudent review of the plans and specifications. E&C Contractors have increased their recent exposure, however, to the performance of subcontractors. When allocating construction risks, appropriate allocation is not achieved due to the inferior bargaining position held by lower tier parties. E&C Contractors tend to push risk down to the lowest level through successive levels of contracting. This approach almost guarantees project delays and increased costs because:

- It pushes risk to the lowest level in the contracting chain where the firms have the least financial depth.
- The lowest levels have to accept the risk because they do not have the clout to ward off the allocation.

- The ability of the firms who are left with the risk can do very little to alter the risk should it emerge on the project.

The result is that accountability is not in line with the risk and E&C Contractors have to fund the completion of the project, and try and recover the costs from the subcontractors or through “extras” from the project’s Owner/Operator.

This issue is actually why E&C Contractors think that Cost Reimbursable contracts are “quality contracts.” Yet, there are Contingency definition misunderstandings with Cost Reimbursable contracts. Under a Cost Reimbursable Contract the E&C Contractor recovers its costs within a contractually defined structure. Owner/Operators use performance type specifications typically for oil & gas projects. Performance specifications give the E&C Contractors wider latitude. Thus, Cost Reimbursable Contracts typically provide that an E&C Contractor recovers the cost of engineering and construction labor, materials, equipment, subcontractors, and overhead. Its profit is a percentage or a fixed amount for Contingency and profit. In a Cost Reimbursable Contract E&C Contractors assume that they have no risk on the cost side, but only with respect to their fee, which causes an under estimation of Contingency.

Let me once again explain. There is a real misunderstanding with respect to total project risk and risk response, particularly in the amount of risk exposure. Investors presume that the Owner/Operators have all the risk because they have to pay for all the project costs. After all, it is not the E&C Contractor’s money that is being spent, and the only thing that E&C Contractors have is the risk exposure in regards to their fee or profit. This understanding is not necessarily so. Owner/Operators currently use various forms of a “Fee at Risk” contracting strategy. For example, if the contracts have 10% fee, it is broken down into a fixed portion, say 4%, and remaining 6% is at risk. The “at risk” portion is typically tied to time, especially where “time is of the essence” and the E&C Contractor has promised a tight time table. If the E&C Contractor does not complete the project timely, its fee or profit is forfeited. This practice is typically called “playing the (risk) cap.” In essence E&C Contractors assume that their exposure on the projects is limited – to 6% in my example. Nothing could be further from the truth.

Owner/Operators typically include “standard of care” clauses that require E&C Contractors to perform engineering and construction to “the highest international standards in the execution of the contract.” Many E&C Contractors underestimate the amount of Contingency to account for these standards of care to which they must perform. E&C Contractors assume that their resources are available and always say that “my people are good,” thus we do not have to worry. In fact, their risk exposure is as broad as under fixed price contracts, especially when they agree to perform some form of EPC project delivery. In the case of EPC project delivery, i.e., where the E&C Contractors provide FEED (Front End Engineering Design), detailed engineering, procurement, and commissioning services, typically they budget these areas very optimistically, and figure the cost exposure of problems is covered by the fee that is at risk, as well as, any extraordinary cost that they will need to spend to assure timely completion. FEED is generally developed by limited, albeit expensive, “process engineers” who do not devote much time in the overall scheme of delivering a project. E&C Contractors normally estimate detailed engineering by engineering hours, procurement is performed as the owner’s representative as a separate fixed fee or on an hourly basis, and commissioning is normally of limited duration. All the costs of construction are also reimbursable, unless they are incurred for “contractor problems.” Any deficiency that the Owner/Operator judges to be the result of the E&C Contractor’s failure to meet these standards of care opens the E&C Contractor to more exposure than its fee!

In addition, this “limited risk exposure” is further exacerbated, because E&C Contractors think that cost reimbursable contracts give them an excuse to cut or reduce project control and contract administration personnel that they would normally make part of the project management team. These cuts are deemed appropriate because (1) the exposure is thought to

be so small, (2) project teams can be leaner and less experienced which justifies (or rationalizes) today's reality, namely that there is a shortage of trained project controls and contract administration personnel globally, and (3) the small exposure allows including younger, less experienced personnel on the project management teams without training because they do not have to be as vigilant, thus allowing experienced personnel to be assigned to fixed price or lump sum projects where vigilance is required. The result is the abundance of caution that E&C Contractors currently express.

The backlog amount is further complicated by issues regarding the booking of "extras" and the pressures that publicly traded companies perceive from Investors. Owner/Operators are obligated to report significant increases in project costs or significant delays in expected project completion. In the example just described regarding what the Services Sector calls "quality contracts," they typically add increases in "costs" to backlog and revenue earned from the backlog, because under cost reimbursable type contracts "Owner/Operators have all the exposure with respect to project costs." Thus, Services Sector companies report margins that reflect the Contingency that they originally estimated, and increases in backlog and revenue coverage of costs actually incurred. The misunderstanding of risk exposure comes from both stakeholders. When cost increases and delays are significant, Owner/Operators invoke the "standards of care" arguments and E&C Contractors have to make an assessment of how accurately they originally estimated Contingency and their management must decide whether to apply Management Reserve to cover the "extras." This issue is the second of the "misunderstanding" risks.

Most non-project oriented stakeholders (either in-house or out-of-house) assume that "Changes," "Extras" and "Variations" are interchangeable. The three are not synonymous! The genesis of the misunderstanding may be that practically all three require a change order. Beginning with "Change," it is a specific work assignment which would not be ordinarily assumed to be required to complete the original project scope. A Change may also be a specific instruction to perform a specific work assignment in a different way from the way in which it was previously defined. I give a few examples of Changes: a Design Change is a change made during the phase of the project which modifies work already done or adds work not normally assumed to be required to complete the original scope of work. Scope Change is an increase or decrease to the original scope of work and usually means a change to the overall specifications or objectives of the project or a contractually defined scope. Field Change is a change initiated in the field to facilitate construction. Startup Change is a change made to facilitate or simplify the startup of the facilities or a change made during the startup phase of the project. A Change may be the responsibility of either the Owner/Operator or the E&C Contractor under a fixed price or lump sum contract. In the case of a Cost Reimbursable contract, the costs of changes typically must be borne by the Owner/Operator.

An "Extra" is an item of work or a method of performing work that is not normally required to complete to the original scope of work. It can arise in the same type contexts as changes, but it is outside what was or would be assumed as necessary to complete the original project scope. "Extras" are the responsibility of the Owner/Operator no matter the type of contract, unless there is an issue with the E&C Contractor's performance. For instance, issues related to the "standard of care" which the Owner/Operator demanded.

A "Variation" generally applies to Unit Price type contracts where the quantities are actually estimated and made a part of the contract. "Variations" are the difference between an estimated quantity and the quantity actually required to complete the item of work. Generally the contract specifies a band (+/-) around the estimated quantity for which the price is valid. "Variations" are the responsibility of the Owner/Operator, unless there is an issue with the E&C Contractor's performance. For instance, issues related to the "standard of care" which the Owner/Operator demanded or issues, such as, if the E&C Contractor misestimated the quantity.

As is obvious, issues are emerging currently as project costs increase and/or are accompanied by delay concerning the “standards of care” that are applicable, which is a broad subject that is beyond this paper. Where there are disagreements between Owner/Operators and E&C Contractors, a Change, Extra and/or Variation morphs into a “Claim.” A “Claim” is a bona fide disagreement between the Owner/Operators and the E&C Contractors for a project as to a Change, Extra or Variation. As far as backlog and revenue recognition against such backlog is concerned, all or some of claims are booked provided the E&C Contractor makes a reasonable assessment of the likely magnitude it will recover. If the project Owner/Operators and the E&C Contractors cannot agree with respect to a “Claim,” the Claim further morphs into a “Dispute.” Once again, there are considerable differences between publicly traded firms in regards to whether the cost of disputed items and/or some portion should be booked and/or revenue recognized. E&C Contractors must assure that they do not recognize revenue from Claims or Disputes that is in excess of the amount of likely recovery because it will necessitate a write down if the amount is not ultimately recovered.

As is obvious, internal or external misunderstandings create a large amount of risk which must be managed by all stakeholders. The heart of Risk Management is the process by which Changes, Extras, Variations, Claims and Disputes are handled at the corporate level or the project level. For Owner/Operators it is the means of preventing or reducing E&C Contractor costs through efficient oversight and quality management. For E&C Contractors it means costs are properly identified and recorded, and they do not give away assets to Owner/Operators by improper or inadequate processes.

### Suggestions for Investors

As far as Investors are concerned, there is no simple answer. They can protect their investment by constant vigilance of the Risks. This vigilance is achieved by constantly questioning the source and conventions that Owner/Operators and Services Sector firms employ regarding such items as backlog. Explore, for instance, how they differentiate between project delivery methods and contract types. What percentage of increases in backlog is represented by different types of contracts? What percentage of revenue increases are from original contract values versus Changes, Extras, Variations, Claims and Disputes? And then determine if the answers make sense relative to the definitions I have provided.

### The Diminished Role of “Pricing Power”

In closing, I have to add a comment on the future of so-called “Pricing Power” of either Owner/Operators or Services Sector companies. Ultimately the power to dictate to by members of either group of Stakeholders will be short-lived. Services Sector companies had maybe two years of dictating the contract type at they thought was better – Cost Reimbursable versus Lump Sum. With any project, you must perform, and many of the Services Sector companies will have to report significantly improved results. Services Sector companies can not just report the same results as in the past when supply was perceived as out stripping demand. The proof will have to be reported within the next year. If the Services Sector continues to execute projects that experience cost overruns and delays and affect Owner/Operator CAPEX budgets as I have indicated, Owner/Operators will demand Lump Sum pricing once again. The issues of Risk Management will be exacerbated by low cost Asian and South American companies and a continuance of the resource shortages that I indicated last year.