THE FOUNDATION OF CONTRACTING

is built on a bedrock of risk. Risk is inherent in all decisions and operations; there is even risk in attempting to maintain the status quo.
Ventures into expanding industries or new market niches can create opportunities for growth and diversification and lead to financial success. However, such ventures can also overextend a contractor’s existing capital, equipment, and staffing – and present real potential for financial loss or failure.

One such emerging market niche, shale oil and natural gas development, has already shifted the global energy market and impacted the American economy by increasing the abundance of domestic energy. However, the current shale oil and gas boom is dependent on favorable pricing based on demand and free markets without manipulation. When oil and gas prices fall, production slows or stops altogether. Contractors engaged in shale oil and gas development projects may experience project delays, slow progress payments, or terminated contracts if the volatility results in a retraction or a bust cycle, as experienced by many emerging markets.

To mitigate these and other risks, it is critical to balance the risk exposures of shale oil and gas development with sufficient controls. As strategic leaders, CFMs should carefully consider the risk to reward ratio before pursuing projects in this frontier market. A comprehensive risk assessment can help identify operational and financial vulnerabilities to maximize potential benefits and prioritize risk mitigation actions.

The New “Oil Boom”

Although shale oil/gas exploration and production is in its infancy, there is optimism about the shale energy boom. Due to two complementary oilfield production technological breakthroughs, hydraulic fracturing (fracking) and horizontal directional drilling, enormous reserves of shale oil and natural gas deposits are now commercially recoverable.

Fracking uses water, sand, and chemicals pumped under significant pressure to break shale rock formations and release the trapped gas and oil reserves. Due to the significant depths of trapped reserves, standard vertical drilling does not release the pent-up shale oil and gas.

Although the process of fracking has been in existence since the mid- to late-1940s, the mechanics – and economics – of fracking changed with the advent of modern directional drilling rigs, ushering in an era of unanticipated exploration and production.
There are many industries poised for significant and rapid growth due to the expansion of exploration, production, transportation, and servicing of shale oil and gas businesses. This economic expansion has a ripple effect as businesses form or expand to meet needs in:

- Various engineering disciplines (e.g., civil, geotechnical, petroleum and chemical, and environmental)
- Construction machinery and equipment manufacturing
- Valve, pump, compressor, and instrumentation manufacturing
- Laboratory and field testing services
- Pipe and metal fabrication

Professional service firms, including accounting, legal, banking, insurance, and surety may also see new opportunities from this ripple effect.

The construction industry is well positioned to capitalize on the expansion of shale oil and gas development for the foreseeable future. The following major areas of opportunity are available to contractors participating in the various shale oil and gas plays in the U.S.:

- Site surveying and permitting
- Site clearing, including right of way clearing and grubbing
- Mass excavation, rough grading, and drainage
- Access and haul truck road and bridge construction
- Concrete pad construction
- Electrical generation, transmission, and distribution lines and substations
- Trenching
- Directional drilling
- Construction of gas line pump, compressor, booster, and metering stations
- Mining and crushing of aggregate and rock
- Dredging and mining of fracking sand
- Water transmission, distribution, and storage

Contractors face four key business challenges when evaluating whether to pursue emerging market niches. These four challenges can be viewed as performance dimensions with a potential for upside or downside swings. The following strategic questions can help CFMs evaluate the likelihood of attaining success in each of these performance dimensions.

- **Competitiveness** – Can the company attain, maintain, and sustain a competitive advantage over other firms? Does the company have a strategic advantage over its competitors (e.g., a stronger balance sheet, key managerial expertise, or related project experience) to exploit the market opportunity? Are there barriers to entry that will impede efforts to capitalize on the opportunity?

- **Growth** – Does the emerging market offer the opportunity for growth? Does the market opportunity offer short-, mid-, or long-term growth potential? Is the primary goal sustainable growth diversification or offsetting declining revenues in a downward cyclical market?

- **Profitability** – Does the emerging market niche allow the company to generate a sufficient ROI? Does the profit potential warrant the increased level of risk and opportunity costs? Are there direct, indirect, or opportunity costs of additional investment that will outweigh the potential increased revenues from pursuing growth in this market?

- **Reputation** – Does the company’s involvement in the emerging market provide opportunity for positive brand image promotion? Or, does the threat of reputation risk due to potential adverse developments, including public opinion backlash, cast a foreboding shadow on the undertaking?
• Railroad construction (tracks and loading stations) and rail bed maintenance
• Drilling and shooting, ripping, or blasting
• Installation of natural gas powered generators
• Heavy trucking of materials, water, supplies, equipment, and machinery
• Installation of oil/gas pipeline, liners, and concrete casements
• Holding tanks for fracking water and chemicals
• Transportation of reclaimed fracking water and remediation treatment facilities
• Welding, radiography, and hydrostatic testing of new pipelines
• Weld inspections and maintenance of existing lines
• Rental of construction equipment
• Cranes and rigging
• Erosion/sedimentation control and restoration
• Steam “cracking” and cryogenic processing plants
• Residential, commercial/retail, and institutional building

**Shale Oil & Gas Emerging Risks**

There are many competing concurrent risks for contractors to evaluate before pursuing work in this market segment. A helpful visual tool for evaluating risk exposures that can manifest in any phase of a construction project or within an industry is a Risk Radar Screen, as illustrated on the next page.¹

The objective of this exercise is to highlight and prioritize risk exposures in six key areas (strategic, legal and regulatory, insurance and surety, human capital, financial, and operational) and determine if these risks would be a major threat to the key business objectives of competitiveness, growth, profitability, and reputation.

The table a few pages ahead depicts potential Shale Oil & Gas Development Risk Exposures, with major representative examples of risk factors to be evaluated in each of the six emerging risk categories.

**Surety Bonding Implications**

The technical complexity of shale oil and gas projects and the unique nature of oil and gas contracts create special exposures to surety credit risk. Contractors are cautioned that their credit payment risk is not limited just because the exploration and production owners are large public companies. Specifically, contractors must understand the surety risks of labor-only and phased contracts prevalent in oil and gas exploration projects.

**Labor-Only Contracts**

Since drilling owners separately contract with manufacturers for pipeline, valves, pressure regulators, compressors, meters, and other equipment, the majority of oil and gas project contracts are labor-only. As opposed to more traditional labor and material construction contracts, labor-only contracts have special restrictions that may limit recovery in a contractual dispute.

Moreover, the owner/obligee typically leases the mineral rights from third-party landowners; therefore, payment protection via traditional lien rights often does not inure to

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¹ The energy industry is composed of different sectors, including oil/gas. Within the oil and gas sector, there are companies engaged in upstream, midstream, and downstream operations. The gamut of these operations are summarized below. The mix of business creation and expansion varies based on the operational streams prevalent in a specified geographic area.

<table>
<thead>
<tr>
<th><strong>Upstream</strong></th>
<th><strong>Midstream</strong></th>
<th><strong>Downstream</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil and gas exploration and production companies</td>
<td>Companies involved in the transportation, storage, and distribution of both natural gas and liquid products</td>
<td>Companies engaged in the refining and marketing of finished oil and gas compounds and byproducts</td>
</tr>
</tbody>
</table>

The energy industry is composed of different sectors, including oil/gas. Within the oil and gas sector, there are companies engaged in upstream, midstream, and downstream operations. The gamut of these operations are summarized below. The mix of business creation and expansion varies based on the operational streams prevalent in a specified geographic area.
the contractor, CFMs should be aware of this exposure and identify in advance legal property descriptions to preserve lien rights as recourse for nonpayment.

A surety principle applying to labor-only agreements stipulates that contractors assume the payment risk of reimbursement for their labor and other costs including but not limited to:

- Mobilization and utilization of equipment
- Management expenses and overhead
- Equipment maintenance and wear and tear
- Cost of union contract fringe benefits
- Other employee benefit costs

Confirming the project funding set aside from the oil/gas company (obligee) can be difficult, and the onus is clearly on the contractor to assure that timely progress payments are received since large volumes of work are typically undertaken during relatively short time periods.

Phased Contracts

Given oil and gas pipelines’ lengthy construction schedules and long distances covered, many of these projects are split into phases. Contractors must understand that sureties typically have limited capacity for phased contracts in which a bond may be required for each phase of the project, and there is no guarantee that bonds will be issued on subsequent phases of contiguous contracts.

Generally, sureties will underwrite each phase of a project separately due to the unique risks associated with each phase. However, sureties must underwrite the entire project scope and schedule to determine the total surety credit commitment compared to the total value of the project.

Defects

Contractors must also be aware of the importance of completing work free from defects in materials and workmanship. A standard commercial general liability (CGL) policy will not cover a contractor for work that was incorrectly performed.

Surety bonds guarantee that projects are free of defective materials and workmanship. In the event that a default is declared due to defective materials or workmanship, the contractor is the indemnitor that will be responsible for assumed tender of defense from the surety. This creates an asset exposure and possible equity erosion for the contractor and can expose the principal’s personal assets.

Project Overruns

The complex geotechnical and engineering requirements of shale oil and gas projects could lead to significant overruns in labor, materials, equipment, and overhead expenses should unanticipated site conditions be encountered. This could have a significant impact on cost of completion and result in a contract default.

For example, unlike traditional transmission and midstream distribution pipeline construction with standard trenching and installation of fixed piping, shale oil and gas production involves the placement of various gathering and separation...
<table>
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<tr>
<th>RISK FACTORS</th>
<th>REPRESENTATIVE EXAMPLES OF RISK FACTORS TO BE EVALUATED</th>
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<tbody>
<tr>
<td><strong>STRATEGIC</strong></td>
<td>Working with new owners in a potentially new industry</td>
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<td></td>
<td>Performing new scopes of work or on a larger scale</td>
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<td></td>
<td>Performing work remotely vs. opening satellite office(s)</td>
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<td>Forming joint ventures or new partnerships with subcontractors or suppliers</td>
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<td></td>
<td>Negative public relations due to environmental activism</td>
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<tr>
<td><strong>LEGAL &amp; REGULATORY</strong></td>
<td>Required certifications to perform work in oil patches</td>
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<td></td>
<td>Differences between standard construction vs. oil/gas industry contracts and MSAs</td>
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<tr>
<td></td>
<td>Legal requirements of land leases, easements, and mineral rights agreements</td>
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<tr>
<td></td>
<td>Complex environmental and regulatory standards</td>
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<td></td>
<td>Threat of pollution litigation and significant legal expenses</td>
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<td></td>
<td>Differences between state and federal regulations</td>
</tr>
<tr>
<td><strong>INSURANCE &amp; SURETY</strong></td>
<td>Credit risk on predominantly labor only contracts</td>
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<tr>
<td></td>
<td>Limited surety capacity for phased or contiguous projects</td>
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<tr>
<td></td>
<td>Availability of special coverage forms and proprietary rates in specialty oil/gas markets</td>
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<td></td>
<td>Sudden and accidental pollution and clean-up costs</td>
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<td></td>
<td>Subcontractor prequalification must evaluate insurance for exclusions and/or sublimits, especially on pollution</td>
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<td></td>
<td>Increased risk of third-party workers’ comp over actions and “stop gap” requirements in monopolistic states</td>
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<tr>
<td><strong>HUMAN CAPITAL</strong></td>
<td>Skilled labor shortage or drawing labor from out of area union locals</td>
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<tr>
<td></td>
<td>Influx of “traveling” laborers</td>
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<td>Heavy overtime schedules, driver fatigue, employee burnout, and stress from family separation</td>
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<td></td>
<td>Need for new hire safety and operational orientation, as new workers have increased injury frequency</td>
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<tr>
<td></td>
<td>Occupational disease exposure from silica or other pollutants</td>
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<td></td>
<td>Workplace violence in work camps</td>
</tr>
<tr>
<td><strong>FINANCIAL</strong></td>
<td>Migration of contract terms between cost-plus, unit price, time and materials, and hard bid lump sum</td>
</tr>
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<td></td>
<td>Potential for overextending capital and cash flow crisis on heavy labor contracts if delays in progress payments</td>
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<td>Major capital investment of new specialized equipment and determining whether to own, lease, or rent</td>
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<td>Cyclical production due to fluctuating global demand and price swings</td>
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<td>Potential to build backlog on work that may be delayed or never started</td>
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<td></td>
<td>Escalating prices of commodity products and supplies</td>
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<tr>
<td><strong>OPERATIONAL</strong></td>
<td>Potential for differing site conditions and dependence on geotechnical data</td>
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<td></td>
<td>Oil boom cycle pushes accelerated production schedules with risk of bust cycle</td>
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<td>Design-build delivery system and assumption of broader liabilities</td>
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<tr>
<td></td>
<td>Increased logistical challenges of mobilization of labor, equipment, and supplies to remote locations</td>
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<tr>
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<td>Supply chain disruptions of pipe, valve, and other critical supplies</td>
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<td></td>
<td>Lack of availability of drill rigs and supporting specialty equipment</td>
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</table>
lines to capture the gaseous and liquid effluents. The technical expertise and labor skills required to operate safely in a congested work envelope typical of this work can differ dramatically from a distribution line project.

**Insurance Considerations**

The construction operations involved in oil and gas development projects also pose unique insurance challenges and exposures for contractors, and the ongoing evolution of this sector warrants specialized professional partners experienced in this industry. Contractors should keep their insurance advisors and underwriters informed of their intentions to pursue work in shale oil and gas development to ensure the appropriate coverages and limits are available and without exclusions for this type of operation.

**Underwriting Distinctions**

It is important to consider the mix of business operations your company is performing. To date, property and casualty underwriting risk appetites have remained broad in considering the classification of the majority of the operations listed a few pages back as construction operations. Generally, operations involving drilling, capturing, storing, transporting (including pipelines), and refining are considered energy operations for underwriting purposes. Furthermore, operations that are in the oil/gas well, over the hole, and on the oil patch are also classified as energy for underwriting purposes. These definitions are being standardized as strict underwriting distinctions between construction and energy operations.

**Specialty Insurance Coverages**

This distinction is important due to the availability of specialty insurance coverages for companies engaged in energy and oil/gas operations. For example, specialized inland marine exposures of energy companies require tailored coverages for oil lease property, rigs, and equipment.

In addition, energy underwriting forms can include coverage for sudden and accidental pollution and clean-up costs, whereas standard construction insurance coverages will have exclusions or lower sublimits if coverage is included.

The transitory nature of the oil and gas workforce may make it necessary to use an alternate employer endorsement to clarify who is considered the employer of leased, temporary, or “traveler” employees. Importantly, insurance is regulated by the states and not all coverage forms, endorsements, and rating plans are permitted in each state.

Moreover, the availability of proprietary underwriting class codes provides energy underwriters with a competitive edge in pursuing desired business classes over other underwriting companies relying on traditional standard (non-specific) Insurance Services Office, Inc. (ISO) class codes. Likewise, specialized energy underwriters typically will have more capacity for umbrella coverages with fewer exclusions and probable higher excess liability limits often required by the oil/gas companies as owner.

**Master Service Agreements & Contracts**

Contracts in the oil and gas construction disciplines are structured differently than standard construction contracts. For example, some oil and gas contracts are written as Master Service Agreements (MSAs). Both contracts and MSAs are proprietary and written by each oil/gas owner. It is unusual to see a contract with “standard” terms and...
EMERGING RISKS FOR CONTRACTORS

Shale Oil & gas

Scientists on both sides of the fracking environmental debate cite research in strong support of their positions, and this ongoing debate has been contentious and controversial.

Fracking requires a large volume of water with varying degrees of recovery and remediation in conjunction with the use of deep injection wells for storage. Pro-environmental interest groups have expressed concern about the potential for aquifer, well, and groundwater contamination from fracking fluids, while pro-fracking interest groups counter that the chemicals used are non-hazardous and improvements have been made in the lining and encasement of drill boreholes to help prevent accidental releases. Additional environmental concerns include capping wells and reducing flaring of gas that cannot be contained.

Shale oil/gas development and fracking operations are also heavily regulated, with oversight provided by a plethora of representative federal and state agencies, including:

• U.S. Department of Energy (DOE)
• U.S. Department of Transportation (DOT) & Pipeline and Hazardous Materials Safety Administration (PHMSA)
• U.S. Environmental Protection Agency (EPA)
• U.S. Department of Labor – Occupational Safety & Health Administration (OSHA)
• U.S. Department of Homeland Security Transportation Security Administration Transportation Worker Identification Credential (TWIC)

Regulatory risk is a real threat with consequences ranging from citations and fines to injunctions and litigation. It is important for CFMs to ensure that appropriate operational and administrative staff understand the various agencies with jurisdiction, the laws and rules the company is subject to, and how to document compliance with these regulations. For more information on shale gas regulations by state, refer to the Web Resources reference on the last page.

ENVIRONMENTAL & REGULATORY RISK FACTORS OF FRACKING

conditions typical of those in construction built off the American Institute of Architects (AIA) A201-2007, General Conditions of the Contract for Construction.

Many of the oil and gas contracts we have reviewed contain broader indemnification language than is typically seen in “standard” construction contracts. It is necessary to perform a careful review of these contracts for unique terms and conditions. Pay special attention for liquidated or actual damage clauses that may be embedded in supporting contract documents.

Design-Build

An increasing number of oil/gas and pipeline construction contracts are now being bid and awarded as design-build delivery method. Design-build increases the ultimate liability to the contractor by expanding the all-encompassing scope of services to be performed, including responsibility for professional liability, contractor’s pollution and environmental impairment, geotechnical site conditions, and equipment and material contracts.

This shifts the financial and operational risk burden from the owner directly to the design-build contractor. Similarly, the procurement of equipment likely will shift the burden for builder’s risk insurance coverage to the design-build contractor.

Faulty Workmanship by Subcontractors & Physical Damage to Property

As with any construction work involving subcontractors, ensure that your GL policy has been amended to clarify that physical damage to property is included in the definition of products/completed operations hazard and if it results from faulty workmanship by a subcontractor, it will be considered an occurrence.
Whether there is coverage for faulty workmanship by a subcontractor has become a subject of much debate with various states taking differing positions, which is a real concern because of the multi-state nature of pipeline projects.

**Heavy Equipment & Independent Truckers**

Construction work involving shale oil and gas development is heavily dependent upon oversized drilling rigs and heavy equipment. Special care should be given to require minimum acceptable motor vehicle driver record screening criteria, driver fatigue monitoring, and distracted driver policies.

With the heavy excavation and removal and movement of earth and materials, utilization of independent truckers is an increased exposure that beckons the use of haul truck agreements with insurance requirements and indemnification language for contractual risk transfer similar to subcontract agreements.

The MCS-90 endorsement is frequently required for commercial automobile policies for trucking carriers regulated under the *Motor Carrier Act of 1980.*

**Field Location & Conditions**

The majority of shale oil and gas construction projects will involve remote field locations. Nevertheless, consideration should be given to the protection afforded by completing pre-construction surveys, especially if blasting and other activities creating vibration is planned or possible. Sufficient pre-planning for bridge clearances, roadway width, and road weight restrictions is critical given the oversized, heavy loads of drill rigs and supporting equipment.

It is also imperative that proper pre-planning identifies essential emergency management procedures, including identification of medical providers (e.g., trauma center and med-flight services). Joint planning with the local emergency medical service on emergency communications and response can help improve the outcome of an injured worker. Emergency procedures must consider that standard radio and cellular communication may be limited or nonexistent due to dead zones in remote locations.

**Conclusion**

Opportunities and threats abound in emerging market niches, and there are winners and losers in the risk management game. Winning in risk management requires identification and prioritization of risk selection and mitigation strategies.

The Risk Radar Screen presents a method for analyzing the relative risks in emerging market niches. CFMs should address the “big and bright blips” on the radar screen with their company’s team of insurance, surety, legal, banking, and accounting professionals. Once it has been determined if a threat is real, it is important to assess the relative degree of impact possible by evaluating the probability and severity of each identified threat.

In the emerging market of shale oil and gas development, contractors, owners, and service providers must determine whether the relative risk to reward proposition represents a gold rush or simply a prospect for fool’s gold. CFMs must be vigilant in monitoring the risks of boom cycles quickly turning into bust cycles to avoid the potential risks of what could amount to a shale shell game.
Endnotes

1. This risk management framework has been presented in prior CFMA Building Profits articles authored or co-authored by Calvin E. Beyer.

2. For additional information on the MCS-90 endorsement, see International Risk Management Institute’s Glossary of Insurance and Risk Management Terms at www.irmi.com/online/insurance-glossary/terms/m/mcs-90-endorsement.aspx.

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web resources


