Risks aren’t new to industry, but in deepwater, strategic management becomes critical

By Katie Mazerov, contributing editor

AS OIL PRICES surge and easy-to-tap reservoirs dwindle, the oil and gas industry finds itself venturing into complicated formations and much deeper waters, using technology that just ten years ago was unfathomable. Now, with the stakes higher than they’ve ever been, an already risky business has become even riskier, with everything from dayrates to currency fluctuations to technology being scrutinized to an unprecedented degree.

The newest frontier, deepwater exploration, is increasingly daunting as operators push the envelope to go beyond 5,000 ft and face billions of dollars in capital expenditures.

“Risks take many forms,” said Cary A Moomjian Jr, vice president and general counsel for ENSCO International. “In our industry, enterprise risks include investment decisions, strategic asset deployment, operational risks, resource (manpower, equipment and essential support service) risks, country, geopolitical and global economic risks,” he explained.

On emerging trends, he noted, “there’s a new paradigm in risk management because the stakes have increased substantially in terms of the investments that oil companies and contractors are making in wells and equipment. The current global situation, with oil prices hitting record highs, means it’s a whole new world, and it behooves everybody to try and address all contingencies in order to manage risks.”

For an industry that routinely brings together operators, drilling contractors and service companies, risk is difficult to define because it’s different for every party involved. “Everyone is playing in the same sandbox – interacting, but each with different objectives and tasks,” said Randall Kubota, general manager for Chevron.

“Risk management is not new, and it is certainly not limited to the oil industry,” he continued. “Even as individuals, we all do this every day, and we have various methods to identify and assess the risks. In addition, everyone has a different perception of risk and a different tolerance for risk. And that risk tolerance can change over time. A good personal example is the risk we have when a child starts to drive. We are nervous and must travel with them, then we limit the distance and time they can drive, and we finally allow them to be independent, until the first crash occurs, and then this hard-won ‘freedom’ might be reined in a little tighter.”
The degree of risk that companies are willing to take is closely tied to the rising price of oil. Fields that ten years ago were considered marginal are now viable. Risk management becomes key to the industry’s expansion on issues ranging from hiring qualified personnel to investing in new technology and equipment.

“There is general risk in the huge expansion mode we’re in, both in the US and worldwide, which involves the ability of all segments of the industry to meet the growing demand,” said Ernie Nelson, vice president, contracts for Nabors Drilling USA. “From our perspective, because all services are at a premium, managing that risk boils down to good project planning.

“The industry was in a low price environment for a long time, and most of the rigs in the United States have been late 1970s or early 1980s vintage,” he said. “The new pricing environment allows us to build new rigs and bring greater efficiency to the marketplace.” And because the new rigs are more automated, there is less hands-on contact between individuals and the equipment, which reduces safety concerns, he noted.

“But at the same time, you also need to expand your labor force, and you have to address the needs of new people coming into the industry who need to be trained in the techniques and appropriate ways of handling equipment,” he continued. Nabors has an in-house training program that includes three training rigs in the United States. “We bring them into the field prepared to work in the Nabors way,” he said.

Ronnie Witherspoon, senior vice president of marketing and business development, added that Nabors has put in place a number of behavior-based training and leadership programs to further mitigate risk for the company.

In term of contracts, Nabors relies on the IADC standardized day work contract form most of the time. The form is “balanced and generally accepted in the industry as allocating risk fairly between the operators and the contractors,” Mr Nelson said.

EMERGING RISKS
Numerous parties are stakeholders in today’s E&P operations.

“In our industry, the term ‘oil company’ is often used to refer to the operator of the field or block,” Chevron’s Mr Kubota said. “But, in reality, it is the government – with its jurisdiction over the field, its law and regulations – that will be the key driver in framing a partnership of oil companies. Operators and non-operators, along with their stockholders and financial/investment partners all have a stake.”

“While risk is not new to our industry, recent activity in deepwater projects presents some very unique characteristics,” Mr Kubota suggested. He cited the critical need to reduce cycle time from exploration to first oil production. “Most of the problems we see in deepwater projects are not those you might generally assume, such as deploying new technology or using an inexperienced workforce. Rather, we are still seeing mistakes made by otherwise experienced personnel or quality issues arising in the subcontractor’s manufacturing processes. This leads us to ask the question, ‘How are these risks being managed by the parties involved?’

“Faced with these new challenges, there are many critical decisions that must be made,” he continued. “First, the financial investment is significant. It is not uncommon to see project
development cost rising above $5 billion for the oil companies. And drilling contractors are now investing in new rigs that are costing approximately $900 million. An error can be extremely punishing to that party."

Another issue involves time lag in deliveries. "Today, some equipment deliveries are stretching three to four years in the future, and investments are subject to changes in the world economy between the time a project is initiated and when revenue starts to be realized," he said.

Finally, interfaces in field development are becoming more complex. "We have moved from production platforms with drilling facilities on board to subsea developments that require in-field pipe laying, riser pulling, production vessel positioning, offloading facilities and infrastructure," he pointed out. "This requires a step-change in project planning so that expensive vessels are not idle and can perform without conflicting with other operations in the area – referred to as Sim-Ops. This could be a conflict in scheduling between the topside control system and subsea installation, or with a drilling contractor’s interface to the power system on a DP rig."

Geopolitical risk, which encompasses the price of oil, tax changes, currency exchange fluctuations and labor agreements, is another form of risk that is heightened with deepwater drilling. "To understand the impact of each of these is simply to study the price of oil," Mr Kubota said. "Ask anyone if they thought in 2004 that the price of oil would be over $100 a barrel in 2008, and most would have said that could not be possible. In spite of this, we still run base economics at much lower price."

An example of a tax implication was the revoking of the Petroleum Revenue Tax in the UK in 1992, Mr Kubota recalled. "This had an immediate impact on exploration drilling activity in the UK sector."

There is also risk in the duration of the project, which varies for each of the parties involved. "For an oil company, that duration is the life of the field, up to 20 years or more. A drilling contractor, on the other hand, will see risk for the duration that the rig works on a specific field, maybe three years," he explained. "And the installation contractor, in turn, will see the duration for their vessels to perform to be somewhere in the neighborhood of 100 days."

In managing these risks, the parties involved have historically started with the basic contracting strategy that is still commonly used: EPIC (Engineer, Procure, Install and Commission). "This places all of the risks and interface issues on the contracted party. With today’s mega projects, that much risk can be more than most contractors are willing to take on," he said.

There is now a trend toward contracts that include incentives, gain/risk share and flexible pricing. "For a drilling contractor making an investment in a newbuild rig, the safest contract might be a five- or six-year contract with a set dayrate, ensuring an acceptable return on the investment," Mr Kubota pointed out. "But, with that strategy, they forgo the potential up-swing in the rig market. On the other hand, the oil company might want a flexible duration contract, but with the ability to change prices if the rig market drops."

So where is the industry headed? "Today I wish I knew what I did not know when we had to make the decision, because most likely I would have made a better decision," Mr Kubota said. "The world must develop all forms of energy, as the demand will not slow down. Offshore development of hydrocarbons will continue, and the complexity will increase."

Also significant in the move toward more deepwater exploration is technology. Providers of that technology manage risk by trying to balance state-of-the-art design with near-perfect performance, again on an accelerated time frame.

"Operators have fast-tracked development, which has pushed the technology implementation schedule," said K Janardhanaan, technical advisor for integrity, risk management and systems engineering for INTECSEA, an engineering and project management company. "We are under pressure to develop technology to meet the needs required in the deepwater environment."
“If you make an investment, you want the return as soon as possible,” he continued. “If your initial return is delayed by two years, then the whole project is liable. Where we come in is in the up-front planning, project preparation and follow-through, and ensuring we can meet the operator’s criteria for safe and environmentally compliant development and at the same time meet project economics.

“The field developments we’re working on have quite challenging flow assurance problems to bring hydrocarbons from the deepwater reservoirs to the refineries,” he added. “These include corrosive products, cold and ultra-deepwater environment, high-pressure and high-temperature products, long distances from the wells to the host facility, capacity and space constraints on the host facility. For example, in Brazil, we are looking at recovery of oil with a high viscosity from deep wells.”

Companies are increasingly dealing with scenarios that require unique designs, like electrical flow line heating, subsea processing, novel host facility designs such as tension leg platforms, and ways of dealing with environmental phenomena not an issue in shallow-water developments.

“The loop current phenomenon in the Gulf of Mexico, for example, is normally not a huge concern, but in the deepwater segment, we have found that this particular force of nature is very significant in running the design of risers and other installation aspects,” Dr Janardhanan explained.

Often, production from a deepwater field is expected to function at 90-95% of the time, leaving little or no room for malfunction of subsea components. “A malfunction in 10,000 ft of water is not simple to repair,” he noted. “You can’t go back and fix it every time. These systems have to be designed for zero-maintenance for 25-30 years.”

Managing risk becomes a delicate balancing act of meeting tight deadlines and still delivering systems that function at a

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very high level to produce expected results. The company works closely with manufacturers to deliver new technologies that meet specifications in the required time frame.

Meticulous design standards, systematic analysis of what can go wrong, comprehensive testing of each component and system function testing before deployment are some of the company’s greatest resources. “Early-life failures really point a finger at design, quality control and up-front planning,” Dr Janardhanan continued.

“We learn from past failures through a root cause analysis and adding to our library of checklists for future projects. We continuously review everything we have and use a very stringent quality control as to the project specifications. While we meet all applicable project codes and regulations, we also make certain that lessons learned from industry experience and failure modes are addressed, and we have minimum standards on which we never compromise.”

Mr Moomjian at ENSCO agrees that risks in offshore drilling cover a broad spectrum of issues, not the least of which results from increasing E&P costs, including dayrates. “The risks tend to intensify as the industry moves into deeper waters,” he said. “Commercial risks, such as future currency fluctuations, insurer renewal capacity and cost constraints, and changes in laws, rules and regulations, are among the issues that are difficult to predict and manage. Political risks, including regime changes in often-unstable countries, are virtually impossible to accurately forecast.”

From his perspective, project risk management begins early in the process, in the bidding and contract-negotiation phases. “Parties to a contract should try to address risk in any scenario and assess every contingency; anticipate the unanticipated,” Mr Moomjian said. “The best contracts are clear and unambiguous, and they cover virtually every circumstance that can be imagined.

“That’s a lofty objective, and it’s fair to say it is rarely achieved in the real world,” he continued. “But, certainly, there is more focus on covering all the bases and addressing every contingency and specifying each party’s respective rights and obligations. The best avenue that can be pursued by the contracting parties is to try to clearly, unambiguously and in a non-conflicting way, address every potential contingency that may arise, including every potential operational risk of loss, of personal injury, property damage, environmental pollution damage, risk of well loss and damage, wild well control and the like.”

ENSCO has a formal process in place to assess a prospective operation in a new country or area of the world. An Executive Management Committee reviews potential new areas of operation, analyzing commercial, political and other risks.

In terms of traditional commercial risk transfer by insurance, the situation has become “very volatile in the wake of hurricanes Rita and Katrina,” Mr Moomjian said. “Coverage is still very limited in terms of hurricane exposure in the Gulf of Mexico.”

“Such insurance is very costly, and the parties, both contractors and operators, are often uninsured or under-insured. And when they are insured, they probably have large deductibles and limited recourse under their insurance coverage.”

The declining dollar is another concern. “If you’re being paid in US dollars, and you have multiple currency expenditures and the dollar continues to decline, that’s a form of commercial and economic risk,” he said. Such risk can be managed in several ways, including currency hedges and contractual provisions. As respects economic risks associated with taxation in foreign operations, “you’re at risk in areas where taxation regimes aren’t very sophisticated and tax exposures can change depending on interpretation.”

In the international arena, drilling companies and their customers are at greater risk for changes in laws, rules and regulations that may impact equipment specifications and modifications that may be needed to continue to do business. Such risks traditionally are contractually allocated to the oil and gas companies.

US-based companies face additional risk in ongoing regulatory compliance. “Both US and foreign regulatory regimes are becoming more complex, requiring additional time and money to comply with various requirements,” Mr Moomjian said. The US Foreign Corrupt Practices Act, in particular, has impacted the way many companies do business as both enforcement and compliance have become more vigilant.

Other regulatory issues impact requirements for classification of offshore rigs, equipment specifications, operational procedures and crew member qualifications, he added.

MANAGING THE LIFE CYCLE

Dave Bozeman, manager of the project support office (PSO) for Devon Energy, which has deepwater exploration operations in the Gulf of Mexico, Brazil and China, agrees that economics is playing a key role in the industry’s expansion into deepwater. But with the move into deeper waters, Devon is giving risk management more emphasis. “As a corporation, we are trying to move toward a much more intentional, more process-oriented and more disciplined approach to identifying and managing risks,” he said. Devon is cognizant of potential political risk and chooses to operate in areas of the world where it is comfortable.

Devon’s philosophy of “high risk, high reward; low risk, repeatable projects” governs its decision to initiate a project. “The initial risk assessment of trying to decide whether to go into an area or not, is the risk of whether there are going to be sig-
significant hydrocarbons that you can find,” he continued. “That’s what lures you to a site in the first place.

“And if the risk of finding those commercial hydrocarbons is reasonable enough, you’re more than likely going to try to get there. That’s a very high-level strategic decision. And once you get there, the more you learn about a given location or situation, the more tactical you become in risk identification, risk evaluation and risk mitigation.”

The company has a process in place for managing risk through the entire life cycle of the project, from site acquisition to exploration and, finally, to production. Project risk is identified in four categories: risk discovery, risk framing, assessment and risk management planning. The process uses a team approach and clearly identifies responsibilities for each team, with an emphasis on accountability.

“That life cycle process is not a continuous one from an organization point of view,” Mr Bozeman explained. “There are three major business segments loosely linked, working closely together at the appropriate times to work through the whole process.”

The business development sector determines in what areas of the world Devon will be involved. Once the reserves are discovered, the PSO gets involved to help operating divisions with development. “Then, of course, there is the operation segment, which is the final stage of a project,” he said.

While the life cycle process has been in existence for many years, the PSO and the methodologies and procedures behind it was launched by Devon less than three years ago.

“I think the introduction of methodology and process into risk management is a relatively new direction that we’re trying to take more seriously,” said Bob Lewis, leader of the business management group for the PSO. “In the old days, when we were drilling in shallow water, resources were easy to find, easy to put on production. You could afford to make mistakes. Speed and urgency was the name of the game.

“Today, it’s different,” he noted. “Drilling one well in the Gulf of Mexico can cost $200 million, so you can’t afford to make mistakes. You have to be very disciplined, very intentional, understand every step of the operation and make sure you’ve done everything you can to avoid mistakes.

“We ask questions,” he continued. “How much experience do we have in the area? Have we been there before? Is this brand new? Has anybody been in this area?”

While not all risks can be anticipated, careful planning can mitigate some issues as they arise, Mr Bozeman said. “In terms of dealing with materials and resource supply issues, “you can hedge by starting early, establishing long lead times for equipment orders.” Contractual strategies or working relationships can be solved with detailed procedures and processes and key alliances in place at the outset.

“There are things you know you know, and there are things you know you don’t know. And there are things you just don’t know,” he continued.

“Risk has always been there, since the dawning of time,” he said. “It’s just that the more complex this business becomes, with more expensive exploration, deeper water and escalating costs, companies are putting more and more emphasis into risk identification and risk management.”