



# Best Practices Help Keep Deepwater Megaproject Capex In Check

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Until the drop-off in oil prices, the global oil and gas industry had been poised for an upswing in deepwater field development construction activity. Several of the industry's most knowledgeable research firms noted that while the next two years will experience a plateau in capital spending for facilities to exploit this segment, from 2016 onward the industry is expected to see a marked increase in capital spending.

This outlook presented a positive gain for new Gulf of Mexico projects and was especially positive for areas such as Brazil and West Africa. The reports estimated that global deepwater spending could reach \$260 billion, a 130% increase over the 2009-13 period.

Much of this expenditure is intended for multibillion-dollar megaprojects.

## **Oil prices vs. capex**

Despite the lowered Brent and WTI benchmarks, there are still plans for significant deepwater megaprojects on the horizon. While the timing of capex budget increases might be delayed, the growth in global energy consumption should support the continuation of megaprojects and

their longer gestation period. In addition, major oil company production has been in decline for the past five years, prompting the need for sustained E&P activities.

There also has been a troubling downward trend in capex on offshore projects that has to be addressed. This has been compounded by the prospect of lower revenue streams. Capex costs on deepwater projects have been escalating for more than a decade at an average annual rate exceeding 10%.

This trend has negatively impacted operating company profitability and return on capital employed (ROCE), defined as net income/year-end net capitalized costs. A decade ago, with oil prices below \$40/bbl, ROCE was above 20%. Today, even when Brent crude was near \$100/bbl, returns had dropped to below 10%, levels not seen since the mid-1990s. At dramatically reduced oil prices, the situation becomes even more precarious and the pressure to reduce costs even greater.

### **What are the problems?**

Decreasing ROCE can be traced principally to project cost overruns and delays to production. There are multiple known and possible causes for the high percentage of deepwater megaprojects that don't meet approved budgets or timely delivery, decreasing their returns on capex.

Floating production facilities are continuing to change, necessarily becoming larger and more technically complex as discovered reservoirs and developments move farther from shore into deeper, more remote locales. Penetrating reservoirs at depths as much as 8 km (5 miles) beneath the seafloor increases risks, unpredictability and costs.

Working at higher pressures and temperatures requires sophisticated leading-edge equipment and techniques. As such, deepwater projects demand more attention and scrutiny. Project coordination and participant interface can be problematic and complicated as significant parts of the project are often sourced and provided by fabricating facilities and vendors from all parts of the globe.

Post-Macondo safety regulations have become increasingly stringent, requiring operators to place an enhanced focus and commitment on HSE issues and their compliance.

Despite those contributing causes, the main culprits of budget overruns and schedule delays appear to be nontechnical. It has been estimated that as many as 65% of project failures to meet costs and schedules are due to softer aspects, including people, organization and governance. Another 21% were contributed by ineffective management processes as well as poor contracting and procurement strategies.

### **What is the answer?**

How can declining ROCE be reversed? There is no silver bullet solution for containing or reducing capex. Much of it rests with a trusted partnership among all project stakeholders, most notably the operator and the engineering/design firm.

Fabricators and construction companies are also closely involved, and all partners—including equipment vendors and installation contractors—need to be integral team members from the project's earliest stages. Sound decisions at key project checkpoints are essential for the project to move forward effectively.

While typically accounting for less than 10% of the total installed cost, FEED is a critical phase and heavily influences project outcomes. If, at the FEED project stage, proper controls, management processes and structure have not been thoroughly established and verified, the project can easily get off track in detailed design and execution, leading to delays and cost overruns. But a high-quality FEED with realistic goals results in higher predictability of costs and schedule as the project is sanctioned and executed.

As capex has escalated, operators have taken a proactive response to keep it predictable and under control by selecting firms with demonstrable systems in place. Since most producing companies are not internally staffed to manage these complex undertakings, they recognize that the success of their projects greatly depends on the competency and efficiency of their partners.

### **Best practices**

Effective project execution is the result of implementing best practices that clearly articulate objectives, define tasks, clarify expectations and communicate performance criteria.

Best practices rely on strict plans and processes in place and accessible to all partners. A robust project management system is a must. It provides a framework for assuring that the proper project tools and systems have been developed, experienced and appropriate disciplines are assigned, and the support functions are competent and intimately involved.

Wood Group Mustang, for example, uses a proprietary management system that is pervasive throughout its organization to assure that all systems, established processes and procedures, historic benchmarks, personnel competencies, quality standards, and safety measures are available for each project undertaken.

This system acts as a continually updated electronic information file cabinet and project roadmap, housing all available data on company procedures at all levels to provide a structure of governance for the entire project life cycle. The system offers the assurance that the project will be done on time, within budget and with no surprises.

## **Technical excellence**

The magnitude, complexity, risks and implications of today's megaprojects to corporate profitability demand technical excellence.

Partners have to understand the project complexity and have the ability to deliver consistency and the right technical solutions worldwide. The model used by successful engineering/design firms incorporates standards, established procedures and clear expectations that are to be followed by every discipline involved. It starts by forming a project team consisting of the most qualified and experienced personnel available in every discipline, backed by the most knowledgeable support team and best tools. Added to the mix are reliable planning and verification procedures that assure the highest level of technical execution and deliverables.

Technical excellence standards and procedures are not intended to limit innovation. Instead, the structure allows the best technical experts to be empowered for expanding on their competency, using their experience and applying the company's proven results to provide the operator with the best solution possible. Lessons learned from exceptional results on prior work can provide cost-effective technical benchmarks for current projects. For example, lightweight designs and proven engineering concepts can be incorporated to standardize or duplicate successful features of prior projects into existing or future assignments.

Technical excellence is not limited to active project disciplines. Project sponsors and experts within the engineering/design firm can readily be called upon to lend their experience and knowledge to solve technical problems or add innovation.

## **Solutions**

The problems that operators have experienced over the last decade with diminishing returns from deepwater megaproject capex have been clearly identified. With reduced crude price levels, the pressures to improve project capital costs have risen.

Solutions are being addressed by operators partnering with project participants who have the experience, technical competence, necessary systems, correct policies and procedures, and reliable support in place. These capabilities will assure predictable and repeatable project delivery based on industry-recognized best practices.

*References available.*

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