Squeezing the Green: How to Cut Petroleum Downstream Costs and Optimize Processing Efficiencies with Enterprise Project Portfolio Management Solutions
Executive Overview

The petroleum industry today faces unprecedented waves of added costs and new regulatory challenges as it tries to navigate the shoals of risk management toward preserving its bottom line.

The historical risk factors alone—e.g., commodity price volatility, geopolitics, etc.—facing the industry have become more complex. Oil and gas price movements are now tethered more to macroeconomic influences than they are to physical supply and demand factors; that makes hedging through commodity-related financial derivatives—a key risk management tool—a dicier proposition. A “brain drain,” aka the “Great Crew Change,” was a critical issue just a couple of years ago for oil and gas companies seeing their pool of qualified personnel dwindle; it will return with a vengeance as activity continues to rebound with economic recovery. Sociopolitical concerns are also changing the playing field with such emerging issues as resource nationalism and foreign investment restrictions. A growing tendency is seen among many nations to capture more rent from the development, transportation, and processing of hydrocarbons—both out of economic impulses as well as a result of market intervention to promote other energy sources for environmental and energy security reasons.

At the same time, huge capital costs have grown even larger, given industry’s increasing proclivity for petroleum processing mega-projects that leverage economies of scale. With the expanding project scope comes bigger challenges to manage project risk.

Such projects entail enormous challenges in logistics planning, scheduling, communications, data management, and risk analysis. With mega-projects comes a great need to better collaborate and share information across the value chain that ultimately will drive down costs and increase the accuracy of delivery dates. Owner-operators, contractors, and suppliers working in the downstream petroleum industry all must find innovative solutions to minimize complexity and risk in these massive undertakings, as it becomes a top priority to have all players on a project team work more closely together.

All of these factors and more are increasing costs or reducing revenues and creating new risk management challenges for refiners and petrochemical producers.

Add to those concerns a greatly heightened regulatory oversight and public scrutiny regarding environmental and safety risks.

Mitigating such risks and demonstrating the wherewithal to accommodate them incurs tens of billions of dollars in the cost of capital, debt, and operations for petroleum processing companies, crimping profitability even in an era of relatively comfortable commodity prices.

Downstream companies must grapple with new compliance constraints, permitting hurdles, and risk-reduction measures in an ever-evolving regulatory environment. Adding to the urgency is the uncertainty over future regulatory regimes, which alone complicates planning and budgeting for both long and short-term petroleum industry projects.
Combine that regulatory uncertainty with a still-recovering global economy and the traditional volatility of an industry whose fortunes are tied to commodity price movements, and you have a daunting mix of challenges for managing refinery and petrochemical projects throughout their life spans.

Project lifecycle management solutions, such as enterprise project and portfolio management (EPPM) solutions from Oracle, enable both executive and project leaders alike at downstream companies to successfully manage costs and reduce risk in such a volatile climate. This paper will address some key management issues facing the downstream petroleum industry from an enterprise project and portfolio lifecycle perspective and then show how EPPM solutions can help minimize risk and thus cut costs.

Introduction

The oil and gas industry has always been the embodiment of undertaking high risk in pursuit of high reward.

Early wildcatters relied on rudimentary and superficial indicators to discover oil and then “rolled the dice” with the drillbit. Failure was far more common than success. Natural gas was a dangerous waste product to be flared off. Gasoline was a loss leader to ensure your crude found a home. The standard of only 1 in 10 exploratory wells being successful persisted even into the 1960s, despite the application of more-modern technology.

As it has matured and evolved from the “Greatest Gamblers” era of the wildcatters, however, the industry has shifted its approach to risk. Today the operating paradigm for the industry is closer to a tightly controlled manufacturing-style business model than it is to the Boom Town mentality of yore. That is not to say that boom-and-bust swings no longer happen or that such a business model makes it easier to manage risk. Quite the contrary: a “factory” business model means dealing with tighter margins and less room for error.

Accordingly, the focus for downstream companies is on how to manage all kinds of risk in order to rein in costs. And that task is more daunting than ever.

Refiners and petrochemical producers over the decades have often grappled with low margins for their products amid the turbulent ebb and flow of commodity prices and supply/demand shifts. Concerns over emissions and safety have long been trouble spots. But now we see those concerns not only heightened but expanded to include carbon emissions—and the consequent demand for alternative fuels that threaten refiners’ markets and petrochemical feedstock costs. Overriding all of these concerns in terms of immediacy, however, is that of market balance: How to address the gap between a growing surplus capacity and a lagging demand recovery? Can refinery and petrochemical plant operators optimize capital and operating costs while addressing safety and environmental concerns in a perpetually low-margin environment? How can
processing plant operators streamline turnaround schedules to minimize costs and downtime over the long term?

An increasingly complex and volatile business environment requires sound solutions for downstream petroleum companies seeking to mitigate risk, enhance efficiencies, and rein in costs while developing projects and managing project portfolios. EPPM solutions provide robust collaborative tools to help meet those goals. EPPM solutions maximize collaboration and integration, real-time and uniform program visibility, and predictability in a way that goes beyond traditional solutions to optimize the value of a project throughout its lifecycle.

This paper will outline specifically how EPPM solutions can help refiners and petrochemical producers to pinpoint the best strategies to develop and implement projects from conception through execution to endgame, which helps manage costs and reduce risk.

Squeezing the Green

The biggest challenge facing refiners and petrochemical plant operators is a familiar one: How to cut costs and optimize efficiencies in a generally low-margin environment while accommodating a spate of new environmental regulatory initiatives. That has been a rallying cry for this sector since the 1970s.

The mission can be thought of “squeezing the green” in both senses: saving money in mission-critical functions while implementing environmental initiatives as cost-effectively as possible.

At times it must seem to the oil and gas downstream industry that each new decade adds an order-of-magnitude greater complexity and difficulty in how to optimize operations to thrive in their respective markets.

Global refining capacity far exceeds current demand, yet more capacity is under construction. Refining capacity in mature markets such as Europe and North America is at risk of closure or being idled, as mega-projects proceed in China and the Middle East with a desire for domestic and international market share expansion somewhat unfettered by a concern for the bottom line. (That is not to say these new projects would be oblivious to return on investment, considering the constraints imposed by third-party financing, but their primary impetus is creating local jobs and advancing the national industrial base rather than profitability.)

The petrochemical sector also is trying to cope with a gradual shift eastward in its global center of gravity, and the current low-cost-feedstock (natural gas-based) environment may prove fleeting.

Growing demand in the developing world—especially China, India, Brazil, and the Middle East—will make the decisions on new projects tougher than ever, given the timing of new capacity outside the mature markets. Because of uncertainties over the macroeconomic outlook
and future demand in emerging markets, capacity utilization will remain a big question mark and thereby usher in more periods of volatility.

Future demand for refined products and petrochemicals also remains a big question mark even beyond the macroeconomic influences. Concerns over climate change not only create costly challenges to reduce individual facility and plant fleet carbon footprints; they also mean less carbon-intensive competing products. While climate change initiatives have lost momentum in the past two years, a return to economic stability invariably revives environmental initiatives.

Given the uncertainty over all the key market indicators, it is imperative that petroleum industry processing plant operators keep a tight lid on operating and project costs and squeeze out efficiencies wherever they can. Major maintenance turnarounds are a particular target for logistical efficiencies because they are necessary and yet become a cost center while draining revenues.

Complex vs. Routine Maintenance

EPPM provides a complete solution for improving the efficiency of both routine and shutdown/turnaround maintenance operations and also for managing the risk of maintenance activities at downstream petroleum facilities. EPPM makes it possible to view the entire resource base of a large organization within a single database. Managers can obtain a view of the entire enterprise from a workload and resource commitment standpoint. In many cases, managers may spot an imbalance of work between different areas and reassign other crews to compensate. Managers can also track resources on an enterprise-wide basis to determine the overall balance between the workload and available staff in order to meet project deliverable goals.

EPPM provides the visibility and tools needed to manage both projects and resources at the crew, area, division, and enterprise levels in an integrated manner, making it easy to see relationships that weren’t visible in the past.

In addition, EPPM solutions integrate resource, scheduling, materials and financial information between enterprise resource planning (ERP) and enterprise asset management solutions (EAM). The result: easier and more accurate project, portfolio, materials, and resource management across the enterprise. By leveraging user-friendly EPPM applications integrated with ERP, plant asset, maintenance, and materials management solutions, organizations can reduce project risks and meet critical delivery dates by effectively forecasting and managing costs, schedules, materials, and resources across the enterprise or at a single site.

Risk is inherent in maintenance projects, especially turnaround/shutdown operations where delays generate revenue shortfalls. Traditional approaches to risk management put managers into the role of firefighters who race around responding to problems. A new generation of risk management solutions integrates with EPPM solutions to fully analyze the risk sensitivity of the project so that the impact of risks is fully understood. The effects of alternate mitigation
strategies can be evaluated at any state of the project, ensuring that the project is proactively managed to avoid the most damaging risks.

Complex Maintenance Case Study

The reversal of fortune for refiners in recent years underscores the urgency of keeping an eye on cost containment, adherence to schedules, and risk management on capital projects today—all the more so on a mega-project such as an epic $7 billion expansion that a major oil company is currently undertaking at its big Texas refinery.

Making this mega-project especially tricky is that it must be accomplished amidst ongoing operations: The refinery will continue to operate at current capacity during the expansion project.

Oracle’s Primavera P6 Enterprise Project Portfolio Management and Oracle’s Primavera Contract Management solutions are the “tools of choice” for the owner-operator, managing contractor, and subcontractors on the mega-project. Subcontractors maintain a construction database and feed that data back to the managing contractor.

The managing contractor then takes all the project data and rolls it up into a master file that reflects accurately the project status, which is then measured against the project baseline. With a project of this scope, dozens of subcontractors and sub-projects reporting data in their own individual ways make it infinitely more complicated to roll up the project data into a master file.

The real benefit of having an EPPM solution is that everyone can communicate across the whole spectrum, all using the same set of matrixes to get to the same data. This helps avoid scheduling conflicts and underpins a sound approach to resource allocation that helps minimize hire and layoff cycles.

Optimizing Maintenance Case Study

A major refiner sought to integrate planning and scheduling for both routine maintenance and major capital projects in its refineries. A particular focus was placed on managing the complex scheduling and planning needs for a $3.8 billion refinery revamp. At the same time, the company sought to support large-scale turnarounds to modernize its refineries while also increasing the efficiency of routine maintenance jobs.

The major refiner upgraded to Oracle’s Primavera P6 EPPM solution to standardize scheduling and planning across the company. The upgrade provided a more flexible solution that enabled the refiner to meet these challenges with an integrated solution that fosters collaboration across the company.

As a result of the upgrade to the EPPM solution, the refiner’s benefits included:
The deployment of new procedures for more efficient handling of hundreds of routine work orders daily at the various refinery sites;

- An estimated cost savings of $3.5 million per year;
- The support of 2.2 million activities; and
- Enabling users without experience with scheduling software to access the system’s Web tools easily to enter data or view reports via customizable dashboards.

Because of the true manufacturing-based business model that refiners, petrochemical producers, and others in the hydrocarbon processing industries rely upon, Oracle’s Primavera EPPM solutions are ideal for standardizing scheduling and procedures for projects large and small, complex and simple, creating cost-saving efficiencies among millions of activities. Beyond the savings, such standardization also helps promote not only best practices to enhance the bottom line but also enforcement of the strongest safety protocols in these complex and vital facilities.

Conclusion

As the downstream petroleum industry grapples with change in every sector and at every level, including an expanding regulatory oversight infrastructure, cost savings and operating efficiencies have become more important than ever.

The best tools for gleaning those benefits are those that provide standardized project planning and portfolio management; enterprise-wide unified reporting; optimized resource use; facilitated, real-time data exchange; comprehensive risk analytics; and simple integration to EAM and ERP systems.

In the end, it’s all about smartly using an approach, such as EPPM solutions from Oracle, to help companies reduce costs at the project, portfolio, and enterprise levels through the project lifecycle.

The downstream companies that are able to implement the best approach to managing risk to their operations in the most cost-effective way will be the ones to best weather another tumultuous decade to come for the oil and gas industry.