

Independent Project Analysis, Inc. is the preeminent organization for quantitative analysis of capital project effectiveness worldwide. At IPA, we provide practices you can use to ensure your success.

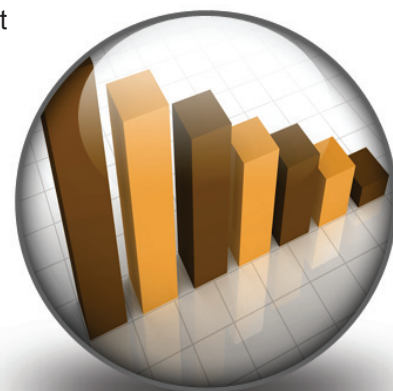
Inside this issue:

The Asset Economics Simulator	1
Global Equipment Procurement for Capital Projects	5
Best Practices for Site-Based Engineering Contracting	9
Improved Onshore E&P Benchmarking Capabilities	11
A Regional Approach to Overcoming Capital Project Issues	12
IPA Events & Presentations	12
Research Corner: Updates for IPA's Current Research Initiatives	16
2013 China Study III Highlights	17
IPA Institute Programs Schedule	19

The Asset Economics Simulator: Bringing Realism to Economic Evaluations of Capital Projects

Tom Mead, Deputy Manager of E&P Research Development

Exploration and production (E&P) development projects are, on the whole, chronic under-achievers. While most projects do make money, this has more to do with the rising oil prices of the past decade than with excellence in project planning and execution. When we remove the effect of rising oil prices, as IPA has done in recent research, it turns out that significant sums of money are left on the table due to cost overruns, schedule delays, and, most importantly, production shortfalls. Our research finds that the average E&P project delivers less than 70 percent of the net present value (NPV)¹ promised when the project was authorized.² This is a sobering statistic and one that raises several questions: What are the biggest factors eroding value in execution? How can we better recognize when project estimates are unrealistically optimistic? How would better forecasts of project results change our investment decisions?



To address these questions and to help improve this performance, IPA has developed a project simulation tool—the **Asset Economics Simulator**—that models cash flows over the life of an asset. The purpose of the Asset Economics Simulator is to show the causal link between front-end inputs and outcomes and to quantify the magnitude of their effect on NPV, so that project planners have the necessary insights for informed decision making.

The key output of the Asset Economics Simulator is the expected change in NPV (Δ NPV) from project sanction through post-startup. Δ NPV serves as a capstone metric that combines the reservoir, facilities, and wells performance to reflect overall asset performance. One of the challenges in promoting a holistic view of E&P asset success is that with so many outcome metrics available, it is easy to lose the overall project story. With production attainment, reserve estimate volatility, and wells and facilities outcomes (predictability and competitiveness measures for both cost and schedule), we have quickly reached 10 performance measures. The inherent trade-offs among these outcomes (e.g., expensive, but predictable) further complicate our efforts to walk away from a project with a clear and concise answer to the question, “Was this a good project?” We have witnessed several projects that never produce any oil, yet the project team walks away citing the excellent facilities cost and schedule outcomes.

This is not to say that these individual metrics are not important; they are, but each in isolation only reflects part of the story. When viewed in concert, they reflect the whole story, but the story remains subject to interpretation depending on how the end user weights each outcome. The Δ NPV metric, on the other hand, is a simple and single objective measure of project success and one that can be readily understood by all parties, particularly the

¹ The sum of discounted cash flows associated with a given investment, a common return on investment metric.
² P. Kirkham and T. Mead, *True Economic Impact of Project Decisions*, IPA, UIBC 2012, November 2012.

Continued from page 1

business function. Effectively communicating with the business function is critical as our research increasingly points to the importance of early business decisions on asset success.

How It Works

Monte Carlo simulation is a very popular technique for estimating likely outcomes, but its insights are only as useful as the assumptions that are fed into it. In our experience, these assumptions, which boil down to probability distributions around key input variables, tend to be too optimistic both in terms of the average and range of possibilities around this average. What distinguishes IPA's Asset Economics Simulator, which also applies Monte Carlo simulation, is in the quality of the underlying inputs that are based on our extensive database of E&P developments and more than a decade of empirical research linking project practices and outcomes.

The foundation of IPA's research into capital projects is that projects succeed and fail in predictable ways. Through our research into E&P developments, we have established a series of practices that drive project outcomes, as illustrated in **Figure 1**. The basic premise is that there is a necessary sequence of activities that lead to asset success—that appraisal and reservoir understanding along with the appropriate scope and technology selection, an integrated asset team, and thorough wells and facilities Front-End Loading (FEL) set the project up for success. Each practice has an associated metric that drives one or more outcomes. For example, Reservoir FEL drives production attainment, reserve volatility, and wells schedule and cost deviation.

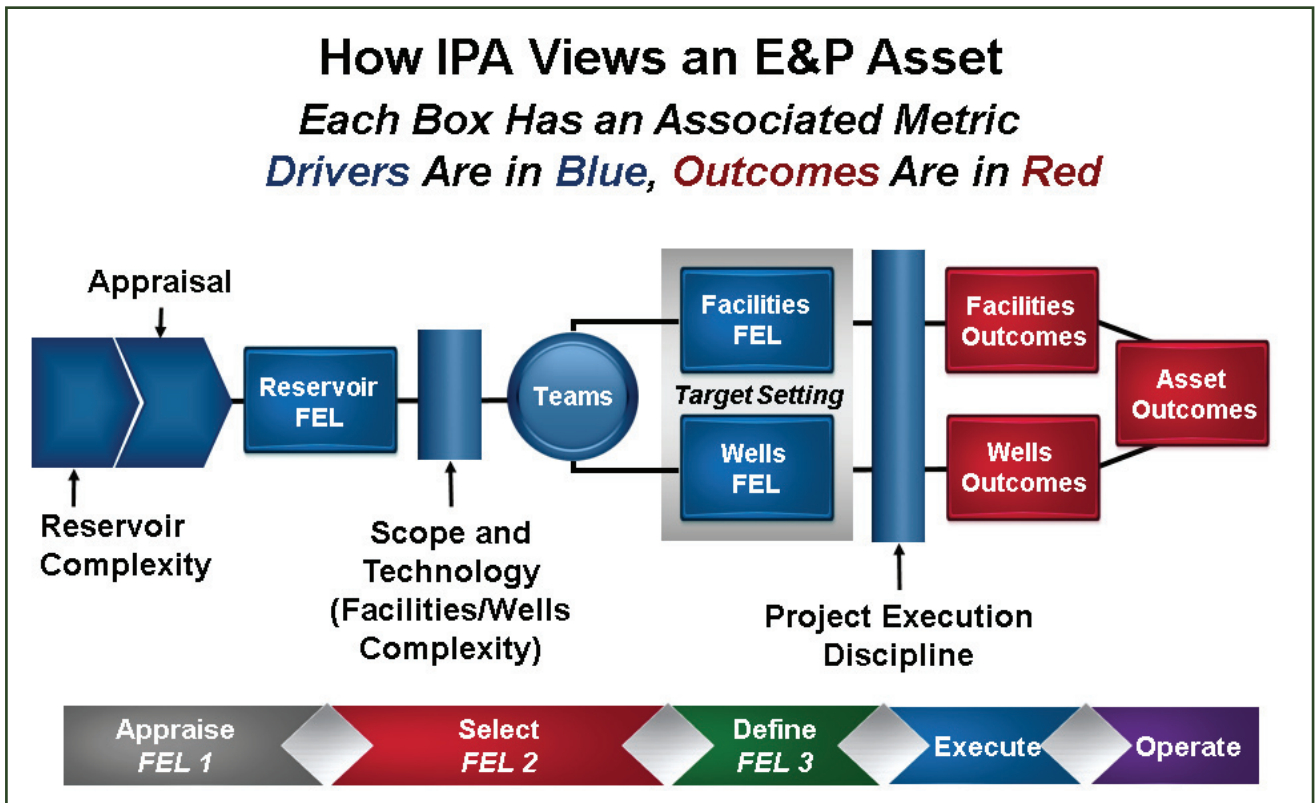


Figure 1. IPA's E&P Pathway to Success Framework

These empirical relationships between project practices and outcomes allow us to estimate realistic and unbiased expected outcome distributions for E&P projects, namely production attainment, cost growth, and schedule slip. Let's consider two different scenarios to illustrate how project definition affects expected outcomes. **Figure 2 and Figure 3** show the expected outcome distributions for two scenarios. The well-defined

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scenario, (**Figure 2**, highlighted in blue), reflects a well-defined project, with complete reservoir information, an integrated team with well-defined scope elements, and reasonable cost and schedule targets. Each outcome distribution is a function of these well-defined drivers and each has very little expected deviation with correspondingly narrow ranges around the p50 value. By contrast, the poorly defined scenario, (**Figure 3**, highlighted in red), has very high p50 expected deviations with correspondingly wide ranges around the p50.

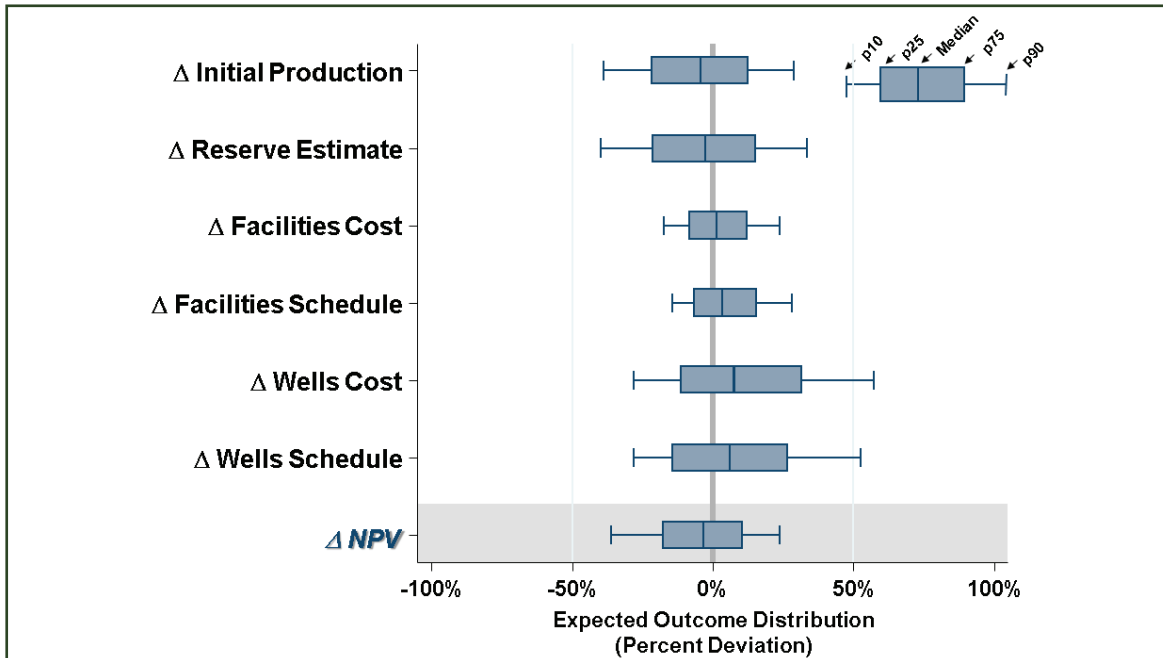


Figure 2. An example of a well-defined project. The relatively low expected deviation and narrow ranges reflect the project's good definition and realistic target setting, all of which contribute to the strong expected Δ NPV outcome.

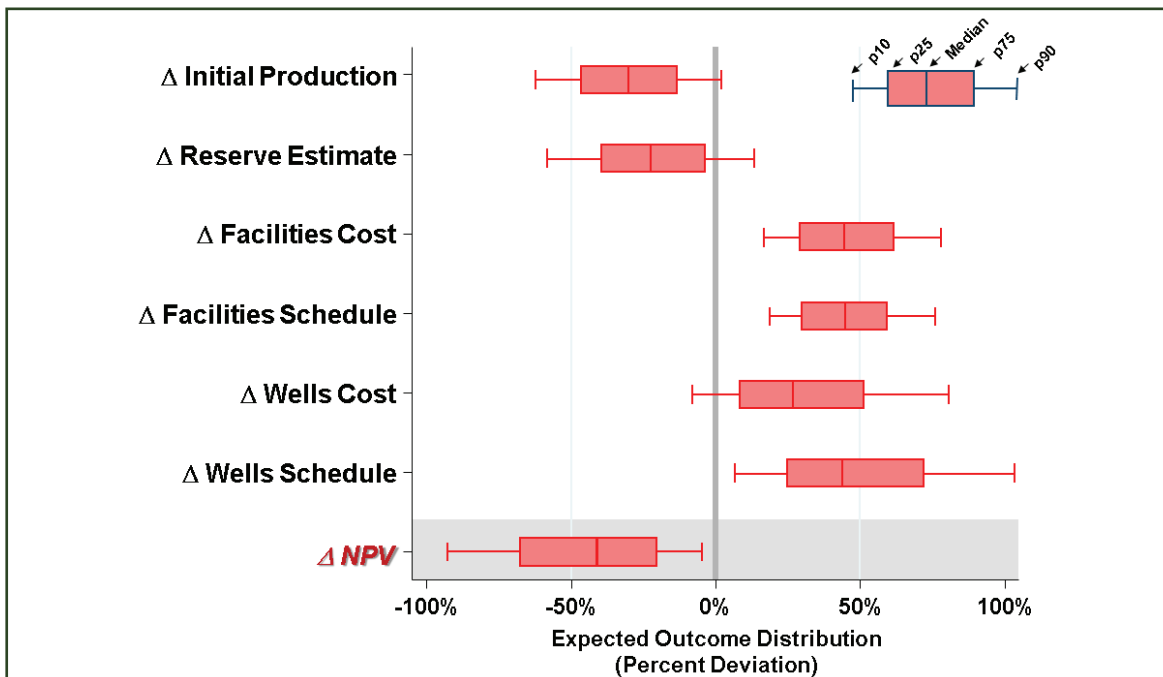


Figure 3. Example of a poorly defined project. The relatively high expected deviations and wide ranges reflect a project with poor definition and unrealistic target setting, all of which contribute to the high expected loss in NPV.

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Each individual outcome distribution accounts for the multiple input parameters that drive it. For instance, wells schedule deviation is a function of the level of subsurface understanding, wells front-end definition, and the competitiveness of the wells duration targets. The Asset Economics Simulator incorporates all of these outcome distributions, each of which corresponds specifically to the project's characteristics, to run the Monte Carlo simulation and establish the likely NPV outcomes.

Getting Value From the Asset Economics Simulator...

The Asset Economics Simulator has two distinct applications:

- (1) it can be applied as an asset system diagnostic tool using completed and ongoing projects to identify key gaps in terms of NPV erosion or***
- (2) it can be used as a predictive tool for an individual project to help decision-makers weigh different development options early in the Concept Selection phase (FEL 2).***

...as a System Diagnostic Tool

As an asset system diagnostic tool, the Asset Economics Simulator generates the Δ NPV metric to evaluate a project system's performance and to help identify the system-specific factors that contribute to value erosion in execution. For completed projects, the Δ NPV metric compares the actual NPV delivered for completed projects (based on the actual cost, schedule, and production outcomes) against the planned or base case NPV (based on the FID cost, schedule, and production estimates) to reflect how well the project delivered the value promised at FID. For projects still in execution or in the planning stages, we compare the project's "expected" NPV (based on the expected cost, schedule, and production outcomes using empirical data) against the planned NPV (based on the cost, schedule, and production estimates) to highlight any project definition gaps.

The Δ NPV metric, when aggregated for a group of projects, reflects the overall effectiveness of the project system in delivering value and highlights the relative contributions of production, cost, and schedule outcomes. This helps prioritize and focus further investigation into the key causes within the context of a specific asset development system. This type of analysis can be conducted through an asset system benchmarking study, which is a dedicated study that determines the project system's competitive position and assess its strengths and weaknesses.

...as a Capital Project Predictive Tool

While quantifying the change in NPV after a project is complete is useful in highlighting and communicating root causes at the system level, it is of little value to the project itself as all decisions have been made and the outcomes are already fixed. For individual projects interested in avoiding common pitfalls, the Asset Economics Simulator can be applied in the early stages of a project as part of IPA's Asset Optimization Workshop (AOW).

The AOW is an interactive workshop conducted at the beginning of Concept Selection (FEL 2) to help companies make critical concept decisions. This session uses the Asset Economics Simulator to provide realistic assessments of how different development scenarios would likely turn out. Sharing these evidence-based scenarios of likely outcomes with decision-makers early in the FEL 2 phase will help highlight the less obvious trade-offs that exist between cost, schedule, and production and will lead to better decision making.

Summary

The Asset Economics Simulator promotes a more holistic view of total asset performance by consolidating IPA's research on E&P asset successes and failures into the Δ NPV outcome, an objective capstone measure of

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asset performance. This tool will help quantify and communicate the effect of decisions to the entire asset team, including the business function, at key points in the project. In addition, it can serve as a diagnostic tool for your asset system to more effectively identify and close key gaps that erode value.



To learn more about how you can use the Asset Economics Simulator to improve your project or asset development system, contact **Tom Mead**, Deputy Manager of E&P Research Development, at tmead@ipaglobal.com.

Professional Profile: Tom Mead, Deputy Manager, E&P Research Development



Tom joined IPA in 2006 and is currently the Deputy Manager of Research Development for the Exploration and Production (E&P) business area. In this role, Tom collaborates with clients to conceptualize and frame new research initiatives and works with senior management to shape IPA's long term research agenda. Prior to taking on his current position in 2012, Tom worked as the E&P Research Team Lead and Senior Research Analyst where he conducted a variety of research studies for clients and IPA's Upstream Industry Benchmarking Consortium (UIBC).

Prior to IPA, Tom experienced capital project success (and failure) first hand while working as an engineering geologist investigating and repairing landslides in California.

Tom holds a Master's degree in International Affairs from the University of California, San Diego and a B.S. degree in Geological Sciences from the University of California, Santa Barbara.

Global Equipment Procurement for Capital Projects

Natalia Zwart, Business Area Manager, Chemicals, Life Sciences, and Nutrition

Procurement of major equipment is important to capital project effectiveness. Equipment represents a significant investment—on average, at least 20 percent of a capital project's total cost is made up of procured equipment. Reduction of equipment costs reduce project costs and provide the competitive advantage. Timely delivery of equipment is needed to achieve schedule goals. Equipment quality is an important factor in how well the facility starts up and operates.

Over the last decade, capital equipment procurement has undergone rapid and profound changes. The Industry saw significant escalation in equipment pricing, from 2003 to mid-2008. **Figure 1** shows the composite equipment procurement trend based on the data collected by IPA. Various equipment types had different levels of escalation, with the highest levels by fabricated equipment, which at the height of the market in 2008 was 2.4 times higher than its 2003 levels.

While equipment prices have stabilized over the last several years, the current increase in project activity in North America is putting upward pressure on pricing and delivery times. Past experience shows that during hot markets prices increase rapidly and equipment quality suffers. During these periods, owners have to deal with overstretched vendors, a decline in skill levels at the fabrication shops, and a limited number of contractors with the capability to transport and install heavy pieces of equipment. Ultimately, this leads to a decline in capital project cost performance as well as schedule, and operability results.



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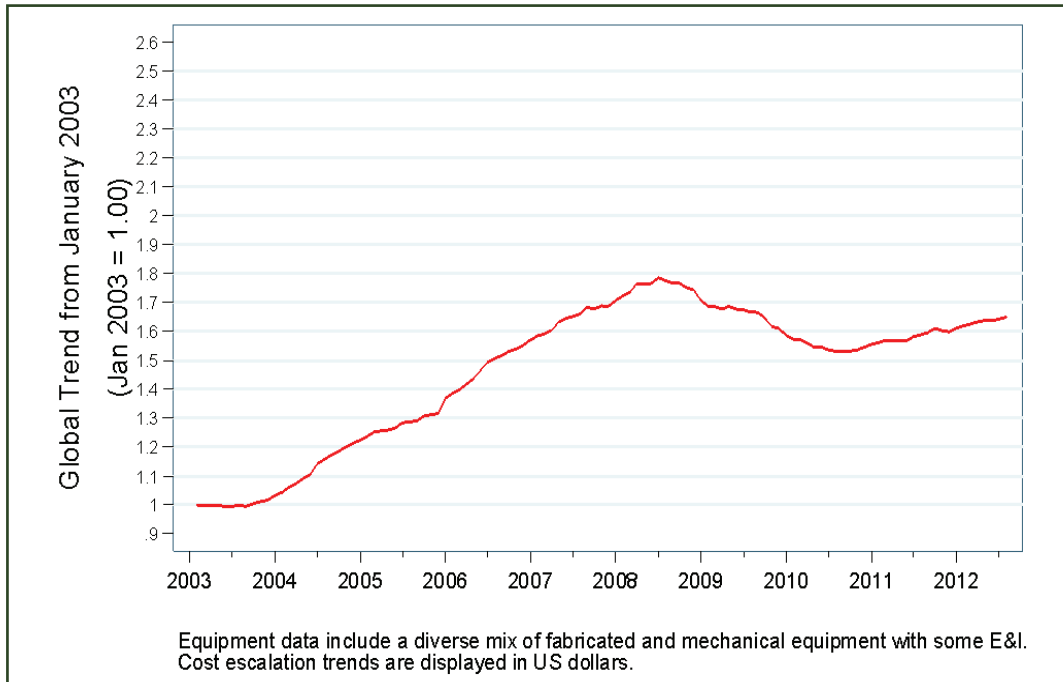


Figure 1. Major Equipment Escalation - Typical Project Mix of Equipment

Another procurement challenge is the rise in Asian sourcing. **Figure 2** shows that the percentage of equipment sourced from Asia has more than doubled. While Asia offers lower prices, the cost savings are often offset by quality problems, long delivery times, and high transportation costs, as well as duties and taxes.

Equipment delivery cycle times have also increased over the last decade. The equipment procurement delivery cycle time is a key factor in project effectiveness. Delivery of vendor data is critical for engineering progress; delivery of the right equipment to the job site when required is critical for construction effectiveness. Problems with equipment delivery tend to have a negative effect on both cost and schedule performance. The last decade also saw an increase in equipment delivery schedule slip.

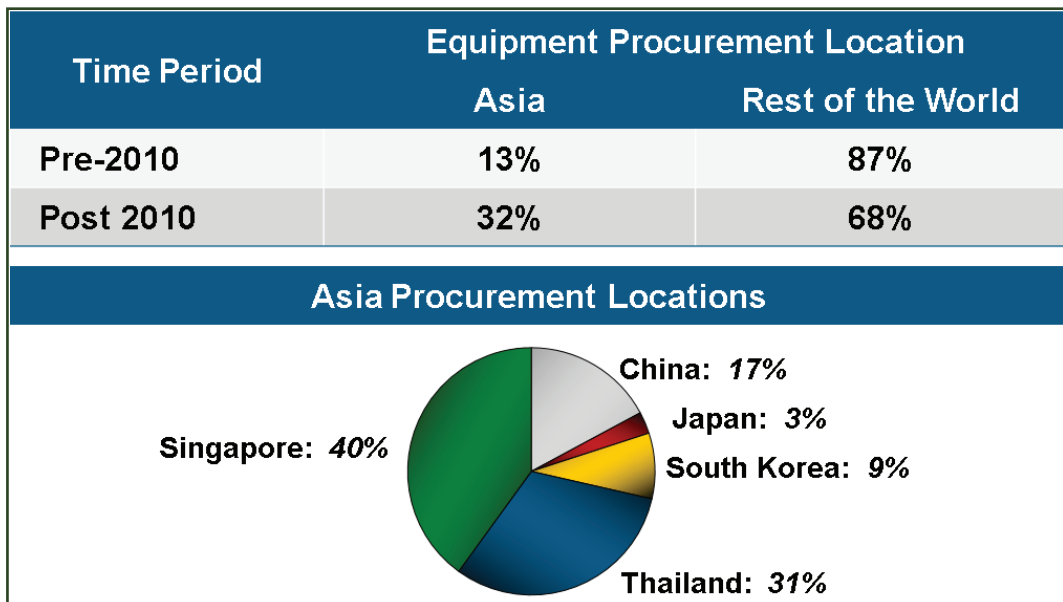


Figure 2. A significant increase in equipment fabrication observed for Asia - Approximately one-third of the recent equipment data collected by IPA was procured from Asia

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IPA’s New Study on Current Trends in Global Equipment Procurement

IPA’s previous research on procurement focused on developing reliable benchmarks for equipment prices; identifying practices that yield better process, faster schedules, and more profitable results; and evaluating the impact of various organizational structures and purchasing practices.

IPA is launching a new study to assess the current trends in the market for equipment procurement. The study will:

- Advance Industry’s understanding of the current trends and practices in equipment procurement for capital projects. Identify practices that reduce equipment costs without sacrificing quality or delivery schedule duration or predictability. The caveat—without sacrificing quality or schedule—is critical because it is easy to reduce equipment costs by buying equipment of lesser quality or from less reliable vendors.
- Evaluate industry practices aimed at improving procurement efficiency, such as organizational structures, procurement approaches, and contracting strategies.

Figure 3 shows a simple framework, which we propose to use to guide the analysis. The framework was developed, in part, from conversations IPA had over the last several months with procurement leads in a number of companies. The framework will be further detailed once we have an understanding of the specific interests of the companies involved in the study and have the access to information and resources. Nevertheless, the framework below is useful to assess how and which issues we plan to address.

IPA’s proposed study will provide an in-depth evaluation of each of the procurement related elements and its impact on project outcomes.

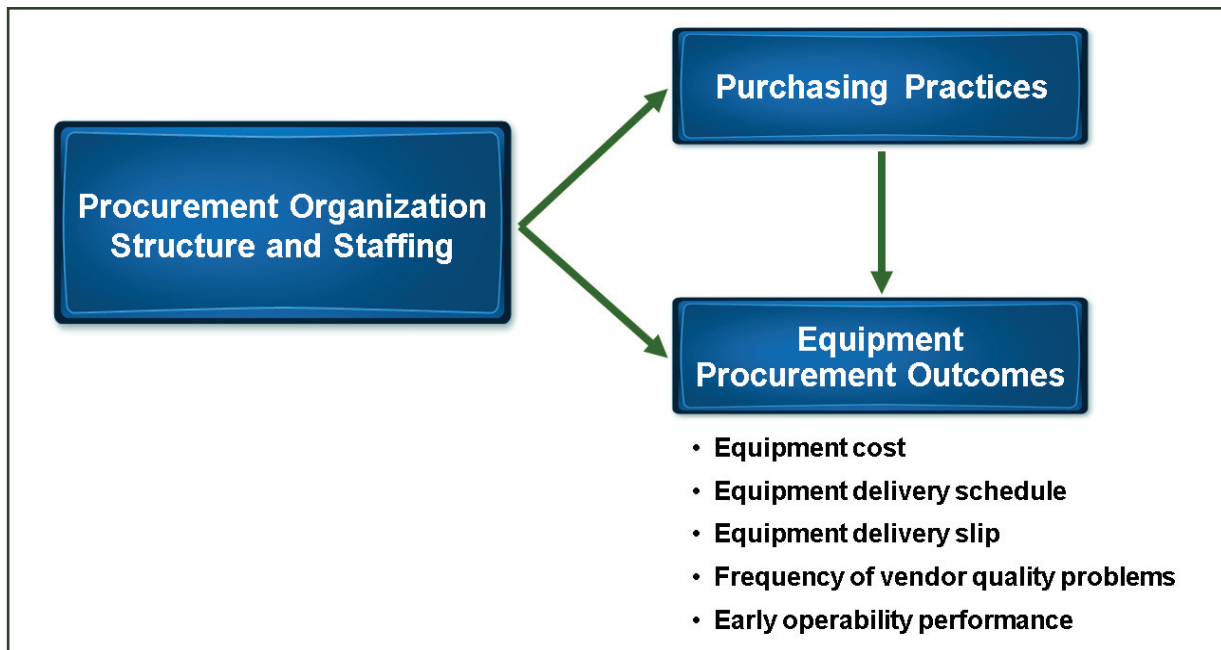


Figure 3. Research Overview - Examine How Each Element Contributes to Results

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Key Questions to Answer

Current Procurement Trends and Outcomes

- What are the current equipment cost trends, delivery times, quality, and operability metrics? What are the regional advantages, if any, for equipment procurement? Do these advantages still exist if we factor in the total cost of procurement, including equipment purchase price, transportation costs, taxes, customs and duties (or any other tariffs and/or taxes), costs associated with quality inspections, expediting, and other?
- What are the best approaches to identify procurement related risk, including political risk, vendor quality risks, and currency fluctuations, among others? What are the most effective approaches for risk mitigation?

Purchasing Practices

- What are the current major approaches to purchase equipment, including competitive bid, sole source, and standing agreement/alliance suppliers? What is the optimal number of bidders to achieve competitive outcomes?
- Do project characteristics, such as project size, complexity, degree of innovation, use of proprietary technology, and others, define vendor selection approaches?
- What are the primary vendor selection criteria and how do they affect project outcomes? What is the optimal timing for vendor involvement and is it affected by project characteristics and other factors? What are the current vendor capacities, capabilities, and quality performance?

Procurement Organization Structure and Staffing

- Should procurement be led by owner or contractor? Which party achieves better results in vendor selection and qualification? Which party should lead expediting, acceptance testing, and quality control efforts?
- Do procurement organizational structures affect the level of procurement resources available to develop and maintain market intelligence as well develop and manage vendor relationships? Do they also affect the level of procurement resources deployed on capital projects?
- What are the best approaches to find the right balance and risk tolerance between procurement objectives and project-specific objectives?

After its completion, IPA's study on Global Equipment Procurement for Capital Projects will provide decision makers with the appropriate information (metrics) available to support and validate current procurement practices and to develop (or maintain) competitive advantage.



For more information on the study and requirements for participation, please contact **Natalia Zwart**, Business Area Manager, Chemicals, Life Sciences & Nutrition, at nzwart@ipaglobal.com

Follow IPA on **LinkedIn** at www.linkedin.com/company/independent-project-analysis



InSites Corner: Highlights from Small Project News and Research

InSites is a blog dedicated to improving small project performance. **InSites** features a series of short articles to address issues to small, site-based projects. These articles address everything from key practices to achieving competitive performance to commonly asked questions about how to prepare for an IPA benchmarking.

To add your name to the distribution list or for more information regarding the blog articles, please contact *Phyllis Kulkarni*, Plant-Based Systems Manager, at pkulkarni@ipaglobal.com, or visit the IPA InSites website at www.IPAGlobal.com/News-Room/InSites.

InSites Blog Article: Best Practices for Site-Based Engineering Contracting

Imagine the following two scenarios:

- A company rolls out a global engineering alliance contract across its sites. All sites follow the same work process, using the same engineering contractor, under the same contractual arrangement and incentive scheme. Yet, even years after this strategy was put in place, the sites continue to show vastly different results – some are top performers, others are laggards.
- Several manufacturing sites are located next to one another, operated by different companies. These neighboring sites use the same engineering contractor, draw from the same local construction labor pool, and are subject to the same conditions in terms of weather, permitting, etc. Yet, the sites show vastly different results – one site has high office costs, the other site has competitive office costs.

These are real life examples that IPA has observed not just once, but many times. We have benchmarked many sites that use the same engineering alliance contractor, yet with very different results. And despite this phenomenon, sites continue to believe that the “right” contractor or the “right” incentive scheme will improve their performance. As a result, it is not uncommon for sites to turn over their engineering contractor every few years, and/or change the alliance structure.

To better understand the perceptions and reality around site-based engineering alliances, Alex Ogilvie, IPA Research Team Leader, recently conducted a research study on this topic and presented the results at the 2013 Industry Benchmarking Consortium. Titled “*Owners are from Mars, Contractors are from Venus*”, the objective of this research was to:

- Investigate what key practices sites use to manage their engineering contractors
- Identify which practices lead to better project outcomes

Whereas most IPA research relies on the owner perspective, this study took a novel approach. Alex interviewed a number of managers at the engineering contractor firms employed by sites that IPA has benchmarked. This allowed us to understand the contractor perspective and identify the factors that motivate and enable them to work in the most effective way for the owner. As in past studies, we found that contracting practices alone do not

Continued on page 10

Continued from page 9

drive success – good contracting approaches need to be combined with other Best Practices, like good project definition, to be effective. That said, we found that the following factors influence the success of the engineering alliance:

- Portfolio forecasting
- Key Performance Indicators (KPIs) used
- Type of incentive scheme
- Distance of the engineering office to the site
- Engineering resource strategy (fixed or dynamic)
- Number of years that the alliance has been in place

This article summarizes our findings regarding the first two practices listed above.

● **Portfolio Forecasting**

All of the contractors that IPA interviewed emphasized the importance of stable, steady work. This allows them to attract competent personnel and maintain staff continuity. IPA found that owner companies can facilitate stable work by maintaining a portfolio-level schedule and sharing the data with the contractor. Yet, only about half of sites use this practice. Further, the range of the portfolio schedule shared with the contractor can vary considerably.

For sites that use this practice, more than half of the interviewed contractors reported receiving a work forecast from their clients that extends just 3 months. However, our analysis showed that those contractors receiving a forecast that extends 36 months tended to apply better planning practices and also achieved better cost performance, even after controlling for the better practices. The likely explanation for this effect is that the contractor, being given a multi-year plan for future work, is more likely to spend time developing personnel to work for that site and invest in the long-term health of that relationship. Further, the development of a multi-year portfolio schedule helps level the resource load, leading to more efficient work.

● **Key Performance Indicators**

Out of all the various Key Performance Indicators (KPIs) employed by alliances, one stands out as universally popular – yet quite ineffective. The KPI “engineering as a % of total installed cost”, or % engineering, is used by all of the contractors and owners that IPA surveyed.

However, IPA’s data show that this is not a very robust metric to use. The % engineering can vary due to myriad factors. Inflation in engineering wage rates can drive the % engineering up, while higher inflation in other categories will drive it down. Use of alloy materials will drive the ratio down. Projects that are more technically complex and/or require a HAZOP, will typically have higher % engineering. Projects that use Best Practices often have a higher % engineering, although they tend to save money in the field. Simple replacement in kind projects will often have a lower % engineering. Unless sites are capable of controlling for all these factors such that they fairly measure the % engineering given the project scope and other factors – and very few are – this metric has little use. Further, many owners are holding contractors to an unrealistically low target for this metric.

We found that the better performing alliances also used task-based metrics, such as hours per task, or hours per deliverable. These metrics gauge engineering productivity more reliably. The sites that used these metrics had office costs that were on average 12 percent lower than Industry, while their overall cost was on average 8

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percent lower. One key was that all the sites routinely shared the metrics with their contractor and reviewed the data jointly – it was a means to discuss and improve performance, not necessary tied to a financial incentive. In contrast, lack of transparency from the owner around KPIs, and/or the use of incentive schemes, can undermine performance.

In summary, whether you are setting up a new alliance or trying to re-invigorate a long-standing alliance, these practices and others can help set the stage for success.

Improved Onshore E&P Benchmarking Capabilities

Jason Walker, E&P Research Team Lead

IPA has completed its initiative to expand its ability to analyze the cost and schedule performance for Onshore E&P projects. This initiative included developing models to benchmark Onshore Wells performance, updating the Gas Plant Cost Capacity Model, and advance IPA's procedures for analyzing Onshore E&P projects within an offshore development.

IPA can now analyze onshore development wells up to a drilled depth of 10,000 meters. The model includes well programs from around the world with a median authorization year of 2007. The average number of wells is approximately 120 with ranges from 2 to more than 800 wells per project.

The update to the Gas Plant Cost Model expands our capability to benchmark gas plants that include condensate in the gas. The range of the condensate throughput of the projects in the model is from 0 to 160,000 bpd.

Figure 1 summarizes IPA's Onshore E&P analysis capability. With the addition of the Onshore Wells cost and schedule models, the IPA analysis of Onshore E&P projects becomes a more complete, whole-asset package.

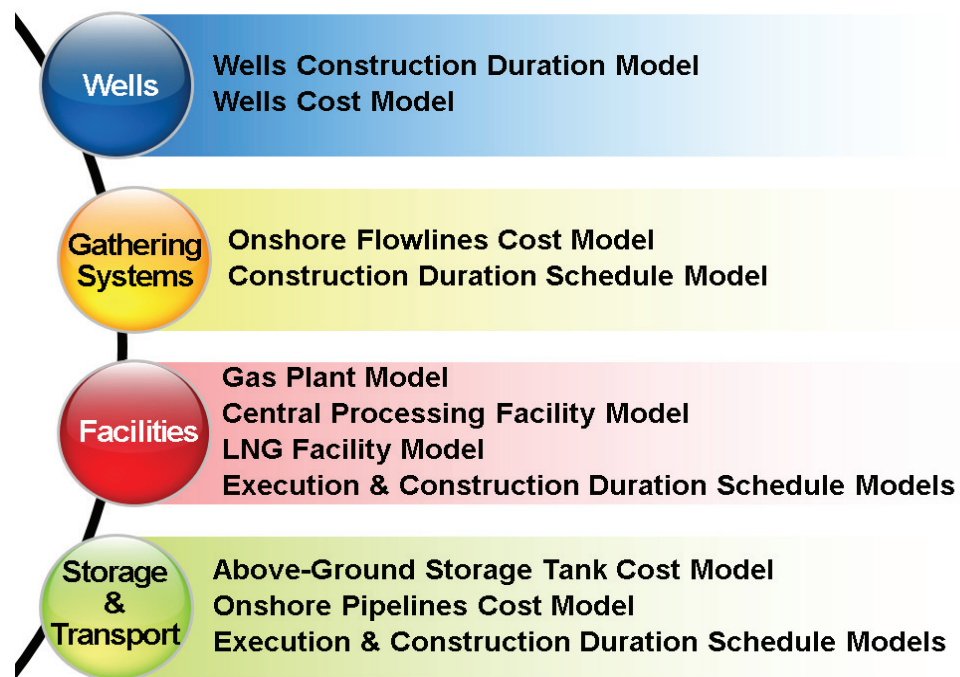


Figure 1. Onshore Asset Summary of Capabilities



For additional information regarding our onshore E&P research, tools and capabilities please contact **Jason Walker**, E&P Research Team Lead at jwalker@ipaglobal.com or **Rolando Gächter**, E&P Business Area Manager at rgachter@ipaglobal.com.



A Regional Approach to Overcoming Capital Project Issues

It is widely known that after studying capital projects around the world for more than 25 years, Independent Project Analysis (IPA) has become the authority on global project Best Practices. With clients increasingly experiencing region-specific challenges to developing capital projects, IPA is addressing the need to help identify and overcome these issues by launching a series of Capital Project Regional Journals, with the first focusing on Western Canada. Subsequent journals will focus on other regions, including West Africa, China, Russia/Commonwealth of Independent States (CIS), and Southeast Asia. In this newsletter, we sit down with Dean Findley (Director of Subscription Services) to learn more about the Capital Project Regional Journals as well as the future of IPA's regional research.

● ***Can you briefly summarize what you hope to accomplish with the Capital Project Regional Journals?***

Our clients are gaining fluency in the application of global Best Practices, which is great to see. What we've seen recently is that when their projects experience problems, it is because of unexpected regional issues. The link between regional risks and capital project performance is an area of research that has not been extensively pursued.

The journals provide an opportunity to quantify the link between regional context and project performance. Different regions pose different project development risks. We are seeking to better understand and measure Best Practices for regions, without ignoring the globally proven project practices that are the cornerstone of IPA's business.

● ***Why did you choose to focus on Alberta, Canada first? What are some of the specific regional issues affecting capital projects there?***

We began with the Western Canada Capital Projects Journal because we already have an extensive database of projects in the region. This enables us to focus on their specific challenges, such as a shortage of skilled labor, very cold climate, more frequent use of modular construction, more frequent mega-project developments, and also oil sand projects, which have characteristics that are unique to Western Canada. Other regions will have their specific challenges, such as onerous local content requirements, difficult joint venture arrangements, changing and difficult environmental requirements, and political unrest, and we will address those obstacles in future region-specific journals.

● ***What value will the regional journals bring to companies that have operated in a particular region for years and are already aware of the obstacles they face?***

Our extensive databases allow us to pursue a research program that is unmatched by other organizations. The research captures the benefits of a wide range of capital project experiences. Project activities in one industry, or one type of project, or one particular region may benefit from the experience of another. For example, both Canada and Australia are regions plentiful in natural resources and have huge land areas relative to their population. Both regions should be able to learn from the experience of the other to improve their project performance. IPA and the regional journals provide an efficient way to derive these cross-region lessons.

Continued on page 13

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Additionally, different companies will pursue different tactics for approaching regional challenges such as regulatory permitting, local contracting & procurement practices, sustainability practices, local politics, demographic issues, and so on. Again, IPA's database enables us to identify and quantify those practices that provide an advantage. Therefore, a company operating in isolation will not be able to improve at the same rate as a company with access to the experience of others.

● What kind of feedback have you received so far about the Western Canada journal?

We have distributed the inaugural edition of the Western Canada Capital Projects Journal to approximately 25 companies and we are in the process of collecting their comments to sharpen our path forward. Many of these companies will become subscribers. But, even for those that are not electing to subscribe, their comments have been positive and they have offered suggestions for improvement. Overwhelmingly, these companies recognize the need for the regional journals and respect our database and the linking of practices to outcomes.

● How do you see IPA's regional research growing over time?

Over the years this work will grow in several ways. First, we will provide additional regional journals. Western Canada will be followed by West Africa, China, Russia/CIS, and Southeast Asia. Other regions are possible and we will pursue those regions with the greatest client demand.

Second, the area will grow through a subscriber network where more direct discussion is facilitated among the subscriber community, which we expect to provide great benefits. For example, very detailed discussion between the regional project practitioners about techniques for improving safety performance on projects with heavy modular lifts in cold climates may reduce serious injuries. Such a network will also enable us to pursue practices for working with local communities and other stakeholders in great detail.

Finally, IPA will be able to improve our quantification of risks due to regional issues. This will feed into our project evaluations and allow us to better establish contingencies and offer suggestions for avoiding regional risks.



Special thanks to Dean Findley, Director of Subscription Services, for sharing his time and offering insight into the region-specific challenges impacting capital projects.

You can learn more about the Capital Project Regional Journals series at www.IPAGlobal.com/Subscriptions, or by contacting Dean directly at dfindley@ipaglobal.com.

The goal of the *IPA Newsletter* is to provide you with research-based articles on current capital project issues, announce upcoming IPA events and IPA Institute course offerings, and introduce new and future IPA products that can improve your project management systems.



To subscribe to the IPA Newsletter and to view an archive of all past issues, please visit our website at www.ipaglobal.com/Newsletter.

To be kept informed regarding upcoming IPA Institute programs and courses being developed for capital project improvement, please join our mailing list at www.IPAInstitute.com.

Upcoming IPA Events & Presentations for 2013



September 16 - 17 **IPA to Present at the PMI Congress in Brazil**

Carlos Flesch, Regional Director of IPA Latin America, will present at the PMI Congress in Belo Horizonte, Brazil. Carlos' presentation will discuss project management Best Practices based on IPA's regional-specific research. For more information please visit <http://8cgp.pmimg.org.br/programacao>

September 19 **IPA to Present at Finding Petroleum Forum Event in the UK**

Rolando Gächter, E&P Business Area Manager, will be speaking at the upcoming Finding Petroleum Forum Event - "Exploiting Deep Water Fields." Here he will discuss and present on *The Unintended Consequences of Taking 'Reservoir Risk'*. The forum will be hosted by the Geological Society in London. For more information please visit www.findingpetroleum.com/event/Exploiting_deep_water_fields/bed90.aspx

October 2 **IPA to Present at the Project Management Symex 2013 in Indonesia**

Bill Bowman, IPA Manager, Asia Pacific E&P Business Development will present at the Project Management Symposium and Exhibition (Symex 2013). The theme for this year's event is "Driving Excellence for Project Executions in Asia Pacific." Bill's presentation, entitled *Industrial Projects – Concepts, Strategies, and Practices for Success*, aims to address what owners need to do differently to ensure success for large, complex projects. IPA is a Silver Sponsor for this event. For more information please visit www.pmi-indonesia.org/index.php/events/special-events/114-symex-2013.

October 2 - 4 **IPA to Present at PMI Queensland Conference 2013 in Australia**

Sally Glen, IPA Melbourne Office Director, will give a keynote speech at the PMI Queensland Conference 2013 at the Brisbane Convention and Exhibition Centre, Southbank, Brisbane, Australia. The theme for the conference is "Motivational Leadership of Projects." Sally's keynote will address the *State of Projects in Australia*. IPA is a Bronze sponsor for this event. For more information, please visit www.qld.pmi.org.au/.

October 10 **IPA President to Present at CELM Event in Australia**

IPA's President and CEO, Ed Merrow, will present at an event hosted by the Western Australia chapter of The Centre for Engineering Leadership and Management (CELM), part of Engineers Australia at the Duxton Hotel in Perth, Australia. Mr. Merrow's talk is entitled "Why do so many large projects fail? Thoughts on the root causes." For more information please visit www.engineersaustralia.org.au/events-all

October 13 - 16 **IPA President to Present at AIPM National Conference 2013 in Australia**

IPA's President and CEO, Ed Merrow, will give a keynote speech at the Australian Institute of Project Management (AIPM) National Conference 2013. The conference will be held at the Perth Convention & Exhibition Centre. For more information, please visit www.aipm2013.com.au/.

Upcoming IPA Events & Presentations for 2013



- October 15 - 16** **IPA to Present at EPCM for Energy and Mining Conference in Alberta**
Keith Mayo, IPA Project Analyst, will present at The Canadian Institute's EPCM for Energy and Mining Conference at the Marriott in downtown Calgary Alberta. This year's EPCM for Energy and Mining Conference has a focus on 'Strategies for Back-End Predictability in Current Market Conditions'. Participants at the conference include owners and contractors across Industry. For more information, please visit www.canadianinstitute.com/2014/482/epcm-for-energy-and-mining.
- October 23** **IPA to Present at NWCCC Annual Meeting in Seattle, Washington**
Katherine Marusin, IPA Project Analyst, will present at the Northwest Construction Consumer Council (NWCCC) Annual Meeting at the Tulalip Resort near Seattle, Washington. The NWCCC is a forum for public and private owners with capital construction programs to learn Best Practices in project delivery. Katherine's presentation will highlight recent IPA research on engineering productivity and construction readiness. For more information, please visit www.nwccc.org.
- October 30** **IPA to Present at the PMI Paraná Chapter in Brazil**
Carlos Flesch, Regional Director of IPA Latin America, will present at the PMI Paraná Chapter in Curitiba, Brazil. Carlos will present IPA research on capital project effectiveness. For more information, please visit www.pmipr.org.br.
- November 11 - 13** **IPA to Present at 2013 CURT National Conference, Tucson, Arizona**
Jose Hung, Senior Project and Turnaround Analyst, will present at the 2013 National Conference of the Construction Users Roundtable (CURT) in Tucson, Arizona. The theme for this event is "Strengthening Owner Performance." Jose's presentation will highlight IPA's Construction Readiness Assessment (CRA) tool which quantifies the critical practices associated with successful construction. The key factors that Jose will address are the relationship between engineering progress and field growth, the impact on construction of delays in equipment and bulk materials delivery on-site, and the role of owner involvement and contractor selection criteria in minimizing field growth. For more information, please visit www.curt.org/National-Conference-2013.aspx
- November 18 - 20** **UIBC 2014 in Leesburg, Virginia**
The Upstream Industry Benchmarking Consortium (UIBC) provides an independent forum for each participating company to view its performance against the performance of other companies. The consortium highlights Best Practices, reinforcing their importance in driving improvements in asset development and capital effectiveness. Consortium attendees learn ways to improve specific elements of capital project execution through presentations and interactive discussions. For more information, contact **David Rosenberg** at drosenberg@ipaglobal.com.

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Research Corner:

Updates for IPA's Current Research Initiatives



Understanding the Drivers of Rising Owner's Cost in the Oil & Gas Industry

Today's landscape in which oil and gas projects are executed is a difficult one. Projects are complex, much larger, executed in frontier regions and done against a backdrop of demographic and supply chain constraints. Yet, the number of projects continue to increase leading to significant sector inflation. Once such area of inflation is Owner's Costs. At the request of several clients, IPA has proposed to launch a joint industry study to identify and analyze the drivers of the owner's cost category within oil and gas projects. The study is currently in the early framing phase with plans to initiate the study in October/November 2013. The study is open to additional participants.

 Neeraj Nandurdikar, Business Manager for Exploration & Production: nnandurdikar@ipaglobal.com


Global Equipment Procurement for Capital Projects

IPA will commence its new Global Equipment Procurement study in Fall 2013. This study will evaluate the total cost of procurement in various global regions and assess strategies being used by companies to maximize procurement effectiveness. The results of the study will help our clients devise more effective equipment sourcing strategies to better support ongoing capital project activities.

 Natalia Zwart, Business Manager for Chemicals, Life Sciences and Nutrition: nzwart@ipaglobal.com

Gulf of Mexico (GOM) Decommissioning

The purpose of the GOM Decommissioning study is to pool the learnings of decommissioning projects in the GOM from several operators and distill them into Best Practices, identify root causes of the poor outcomes, benchmark company performance against Industry as a whole, and guide later projects on cost and schedule planning. Additional data for intact platform decommissioning and well abandonments have been received and the preliminary cost and schedule analysis is being prioritized. The study remains open to additional participants.

 Jonathan Jordan, Study Principal Investigator: jjordan@ipaglobal.com

U.S. Hot Market Study

The boom in U.S. shale gas and oil production has generated what could be the nation's largest-ever build-out of infrastructure and derivative capital projects seeking to take advantage of cheap and plentiful natural gas. Close to \$90B of investment has been announced for the US. A large percentage of these investments are megaprojects, and several are outside of the greater Gulf Coast area. Past experience shows that project excellence is difficult in hot markets. IPA is in the process of conducting a US Hot Market Study to research and understand supply chain weaknesses, such as owner and contractor resource shortages and procurement issues. The first phase is to examine the historical effects of the last hot market in the U.S. and will be complete in September 2013. The second phase will look forward to the coming hot market and is scheduled to be complete in November 2013.

 Kristin Lewis, Study Principal Investigator: klewis@ipaglobal.com

Megaproject Team Staffing Assessment

IPA recently completed the development of the Megaproject Team Staffing Assessment for E&P projects and commenced research on megaproject teams in Refining, Chemicals, and Distribution. The goal of this assess-

Continued on page 17

Continued from page 16

ment is to provide owners and project teams with specific benchmarks on the number of owner lead positions required and to identify the owner functions that are critical to the success of the project. This assessment will be available to projects \$350 million and greater in the Refining, Chemicals and Distribution industries in November 2013, and in the Mining, Minerals, and Metals industries in February 2014.

i Kate Rohrbaugh, Research Team Lead, Teams & Organizational Research: krohrbaugh@ipaglobal.com

Benchmarking Tank Maintenance

At the request of several clients in the refining and transportation/logistics sectors, IPA has initiated a Benchmarking Tank Maintenance Study to compare the cost and schedule competitiveness of their tank maintenance programs. Companies in these sectors must continually clean, inspect, and repair their numerous tanks. These projects do not generate revenue, but can be quite costly to execute. Further, they typically require taking tanks out of service. Hence, executing tank maintenance efficiently is vital. This study will identify the best metrics to use to gauge competitiveness and allow participating companies to compare their metrics (e.g. \$/barrel) and approaches versus industry norms. IPA will begin data collection for the study in September 2013. The study remains open to additional participants.

i Josh McClellan, Study Principal Investigator: jmcclellan@ipaglobal.com

Benchmarking Allocation of Sustaining Capital

This multi-client study is investigating sustaining capital allocation practices and expenditure levels in the Mining, Mineral, and Metals (MMM) sector. IPA has collected information from more than 40 operating sites representing the four participating organizations (whose combined recent annual sustaining capital expenditure is US\$7.1 billion, or 15 percent of total capital expenditure). The sample comprises of mines (49 percent), mineral processing facilities (20 percent) and smelters (30 percent) distributed globally and producing iron ore, coal, copper, alumina, zinc and other mineral commodities. Information gathered from each site includes historical and projected sustaining capital expenditure levels, data on the types and distribution of sustaining capital projects, information on the methodology and practices used to determine sustaining capital requirements as well as site specific characteristics such as process complexity, overall facility performance and key economic indicators. The study will allow the participants to compare sustaining capital planning and development methods and expenditure requirements for different types of MMM sites. The study is currently in the analysis phase and remains open to additional participants.

i Petros Kapoulitsas, Study Principal Investigator: pkapoulitsas@ipaglobal.com

2013 China Study III Highlights

Pei Hsing Seow, Associate Project Analyst and Natalia Zwart, Business Area Manager



Western companies have executed hundreds of major capital projects in China in the past two decades. While it is no longer considered “the frontier,” some companies are still struggling with framing and executing successful projects in China. Changes in regulations, labor demographics, and the dynamic market environment are challenging to project teams.

With such challenges, what are the practices necessary for Western companies to execute cost and schedule efficient projects in China? What defines a successful capital project in China from the perspective of Western companies? What are the key success factors for executing projects in this region? How much cost savings can a Western company realize? How much speed can be achieved in China?

Independent Project Analysis, Inc. (IPA) has conducted three detailed quantitative studies in order to address

Continued on page 18

Continued from page 17

some of the key issues associated with building facilities in China since. In 2005, IPA first launched a multi-client China study, with the objective of understanding the true cost advantage that can be achieved by Western companies building capital projects in China and to highlight practices required to achieve these savings. In 2009, after the instability brought to the project world by the hot market situation globally, IPA updated the China Study to understand how costs and schedules had changed, and what additional new practices were needed to assess the new environment.

In 2013, IPA finished the latest round of research on project performance in China. The study reviewed the validity of the previous China findings; reestablished performance benchmarks; and explored the latest challenges to doing projects in China. The study used data from over 150 capital projects executed by 33 American and European companies in China and several China specific surveys; 64 projects were added to the database since the 2009 China Study. The data represented over US\$10 billion in capital project work done in China between 2000 and 2013. The data included projects that were executed as part of joint venture (JV) agreements with mostly Chinese partners, or as part of wholly owned foreign enterprises. The data include all project types and various project sizes.

Key Findings

Businesses remain overly optimistic about opportunities in China

Making accurate business forecasts remains difficult in China. Many Western projects overestimate market demand for their products.

It is getting more expensive to design and build capital projects in China

China offers cost saving opportunities for capital projects, but price growth for project related services in China outpace those on the USGC. Western companies should not expect the same level of savings that were possible a decade ago. IPA's study quantified the current differences in costs between China and USGC in a number of key cost categories.

Ability to leverage local resources is current key to differentiation

As Western owners have gained more experience in China, they have shifted towards using more local project management resources. IPA's study shows the cost savings available through use of local PM resources, the most effective methods for using these resources, and how specific project characteristics influence the use and effectiveness of local versus expatriate resources.

Contracting strategy depends on resources and experience

Companies developing local competencies and gaining experience have started to employ multiple contracting strategies rather than just relying on the EPC approach. IPA's study shows the characteristics of projects that employ these other strategies to provide an insight on their choices.

Proper quality management is key to success

Quality is one of the most commonly cited capital project problems in China. IPA's study provides an in-depth look at the quality from Chinese Design Institutes, procurement quality, and field construction quality, as well as the successful practices projects have employed to achieve better performance.

Intellectual property protection requires extra cost and takes time

Most of the Western projects in the study took special measures to protect IP. IPA's research quantifies the cost and schedule effect of IP protection measures.



For additional information regarding the China Study III and to learn how your company can participate in IPA's ongoing research on projects executed in China, please contact:

- **Pei Hsing Seow**, Associate Project Analyst and Lead Author, at pseow@ipaglobal.com
- **Natalia Zwart**, Business Area Manager, Chemicals, Life Sciences & Nutrition, at nzward@ipaglobal.com



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ADVANCING PROJECT KNOWLEDGE

2013 IPA Institute Programs Schedule

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Public Courses

Project Management Best Practices (22 PDUs)

September 17 - 19: Abu Dhabi, UAE

October 8 - 10: Moscow, Russia

November 12 - 14: Johannesburg, South Africa

September 24 - 26: Kuala Lumpur, Malaysia

October 29 - 31: Shanghai, China

Best Practices for Small Projects (22 PDUs)

September 24 - 26: The Hague, The Netherlands

November 12 - 14: Curitiba, Brazil

October 8 - 10: Orlando, Florida

November 12 - 14: Sydney, Australia

Gatekeeping for Capital Project Governance (16 PDUs)

September 25 - 26: Houston, Texas

Best Practices for Mining Projects (16 PDUs)

September 25 - 26: Belo Horizonte, Brazil

Megaprojects - Concepts, Strategies, and Practices for Success (22 PDUs)

October 9 - 11: Perth, Australia

October 22 - 24: Houston, Texas

October 22 - 24: Bogotá, Colombia

Practices for Shorter, More Cost-Effective Turnarounds (14 PDUs)

December 11 - 12: The Hague, The Netherlands



IPA improves the competitiveness of our customers through enabling more effective use of capital in their businesses. It is our mission and unique competence to conduct research into the functioning of capital projects and project systems and to apply the results of that research to help our customers create and use capital assets more efficiently.



The IPA Institute's mission is aligned with the overall IPA mission to improve the capital productivity of its clients. The programs offered provide a forum for in-depth understanding of key elements of the capital project process and how to apply these learnings to effect positive changes and improvements, resulting in the more effective use of capital.

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