

IPANewsletter



JUNE COVID-19 REPORT



Stopping and Restarting Capital Projects in the COVID-19 Landscape

By Ronell Auld, IPA Advanced Associate Project Analyst

The COVID-19 global health crisis has shaken owner companies in nearly all capital projects industry sectors to the core, forcing them to reassess the future of individual projects and entire project portfolios. Owner companies deciding to press the pause button on projects to conserve cash flow may ultimately increase project expenditure in the long run. They now seek to understand the most effective practices for stopping and restarting capital projects without eroding business opportunities.

IPA has been reaching out to our clients—the global leaders in the energy, chemicals, refining, pharmaceuticals, consumer products, and other processing sectors—to understand how they are navigating their businesses and capital projects through these difficult times. Employee health and safety concerns, supply chain disruptions, and cash flow concerns have forced hundreds of projects to shut down. Meanwhile, many projects that have continued still face an uncertain future. “The most difficult element ... is the uncertainty about restart possibilities,” IPA Capital Solutions Director Deb McNeil wrote back in March, just as many owners were beginning to respond to regional social distancing mandates.

According to a rolling survey IPA is conducting:

- Owners are reporting average annual CAPEX cuts of 34 percent
- 76 percent of companies surveyed in April 2020 say they are planning to delay projects due to the COVID-19 pandemic’s effects
- On average, companies say they have suspended approximately 15 to 20 percent of their projects; the anticipated suspension times vary, but a majority are postponed for at least 10 to 20 weeks

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IPA Data on Stopping and Restarting Projects

IPA recently reviewed 207 capital projects in its proprietary projects databases that were halted and restarted. The projects range in size from 2020US\$17 million to 2020US\$5.5 billion. The projects are representative of a diverse set of industrial sectors, including refining, chemicals, and mining. The median cost of the projects in the stopping and restarting project database is 2020US\$80 million. Cost and schedule driven-projects are represented, as are greenfield and brownfield projects. Most projects are located in the United States, but Europe and Asia are also represented. The goal of the analysis was to measure the effects of project stop and restart on project outcomes and identify practices that drive cost effectiveness improvements.

Project stoppages are not without precedent. In the wake of the 2008 Global Financial Crisis, IPA observed a number of projects that stopped and restarted, with an average gap of 13 months. In more recent years, natural disasters, including hurricanes making landfall along the U.S. Gulf Coast and large wildfires across North America and Australia, forced owners to stop projects in their tracks and map out plans to get them going again. However, many project directors have never been in the difficult position of having to stop and restart a capital project while attempting to preserve its anticipated business value.

Key Research Findings

Before project leaders get too far ahead with their work stoppage and restart plans, they should be aware of the following, based on IPA's findings from this dataset:

- Projects stopped in definition had essentially the same cost growth performance as those that continued uninterrupted (Figure 1).

- Projects stopped and restarted in execution incurred 4 percent greater cost growth than projects that continued uninterrupted (Figure 1).
- Projects stopped and recommenced during construction experience 11 percent more cost growth compared to projects that halt and resume in the middle of detailed engineering (Figure 2).
- Appreciable differences exist in the capital effectiveness of projects restarted at greenfield sites versus colocated sites.
- Projects stopped due to turnaround (maintenance shutdown) date changes experience especially poor cost outcomes; this is an important finding because a number of companies have recently postponed major turnarounds due to the pandemic.

From these data, IPA can assist project and portfolio managers in:

- Quantifying the cost and schedule risk associated with projects based on when they were shut down and when and how they may be restarted
- Creating models for future projects to predict the effects of stopping and restarting in engineering and construction
- Re-baselining project cost and schedules for projects that may be restarted

Best Practices for Stopping and Restarting Projects

IPA has already identified several learnings and Best Practices that owner project leaders can deploy to strengthen their own project stopping and restarting practices to drive cost effectiveness improvements. For example, best performers:

- Receive input from all key stakeholders when decisions are made to halt and restart

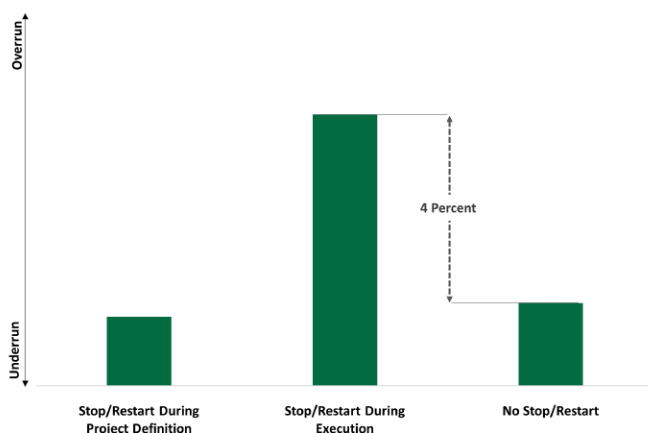


Figure 1: Cost growth is worse when stopping and restarting projects in execution.

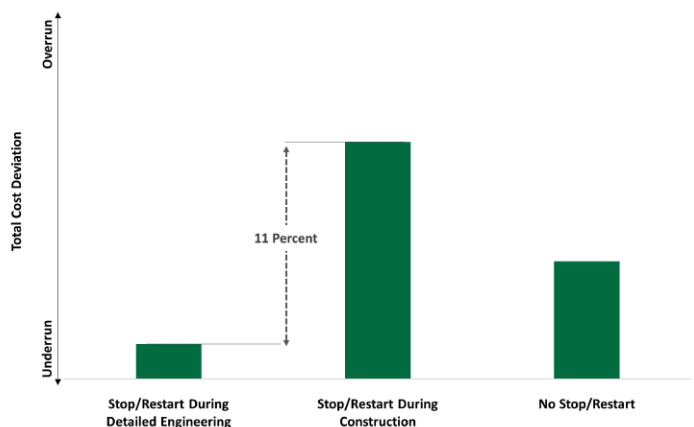


Figure 2: Cost growth is lower when stopping and restarting projects during engineering.

IPA Newsletter

Independent Project Analysis, Inc.
Volume 12, Issue 2
June 2020

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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.



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- Ensure the continuity of project teams from when activities are halted to when they recommence
- Make better use of progress reports and project controls
- Have less project manager turnover throughout execution

IPA has seen projects that have been stopped and restarted successfully. A few years ago, a \$500 million production facility expansion project put on hold for 9 months in late engineering achieved an industry average cost outcome and good safety performance. During the project delay, several key functions were allowed to continue working on the project design. The downtime was used to conduct in-depth execution and Constructability Reviews. The design was optimized, which resulted in significant cost savings after the project resumed. The project received an engineering excellence award for this achievement. Unfortunately, such successful project outcomes are not the norm.

Clear advantages result from possessing reliable project data and guidance about the cost benefits and detriments of pausing projects at certain delivery phases and knowing which practices are proven to result in more successful outcomes.

We applied this research to help one company support its decision-making, as senior management was debating whether to halt or continue the company's highest profile project. The company sought to answer several key questions:

- What would be the expected cost effect of stopping and later restarting the project?
- Was there an optimal point at which to stop the project?
- What are pros and cons of stopping versus just slowing down the project?

We narrowed the dataset described above to align with the characteristics of the project in question, such as size and location, and quantified the expected cost and schedule effects. We also tabulated pros and cons of stopping versus slowing down, and identified key Best Practices and watch-outs for each option. We can assist other companies faced with similar tough decisions.

IPA has been the global leader in driving capital effectiveness since 1987. Today, IPA's capital projects databases contain detailed data from more than 20,000 projects located worldwide from all industrial sectors and of all sizes and levels of complexity. Just as we have done during numerous global and regional crisis events in the past, we will partner with our clients to help them successfully navigate through the coronavirus pandemic and help them implement lasting improvements.

Contact Ronell Auld at rauld@ipaglobal.com to learn more about IPA's stopping and restarting projects research and to find out how IPA can help project leaders increase the likelihood of preserving the value of capital investments.

Responding to the Oil Price Drop Amidst COVID-19: Lessons From History

By Neeraj Nandurdikar
Director, IPA Oil & Gas Practice

In the Roman calendar, the Ides of March simply referred to the 74th day of the year, which roughly corresponded to the 15th day of March. Later on in 44 B.C., the date became notorious as the day when Julius Caesar was assassinated, which marked a turning point in Roman history. The phrase “beware the Ides of March” became symbolic of pivotal moments, or turning points in history, after Shakespeare penned Julius Caesar at the end of the 16th century. In the future, when the history of the oil industry is written, our Ides of March may very well be the 18th of March: the day when the price of a barrel of oil touched the low 20s (\$21.20)¹—a level it had not seen since the 1940s on an inflation-adjusted basis. So let us explore our present situation amid the COVID-19 pandemic and in the wake of, yet another, global oil price fiasco.

The COVID-19 pandemic may very well change social and business practices when it reaches an end. As for lower oil prices, unfortunately—or fortunately depending on whether you are the half-full or half-empty kind—the oil and gas industry has been in this situation before, albeit today we are facing both supply and demand driven pressures on price. What should our response be?

The actions industry should take may not look all that different from those taken by companies that have become industry leaders following previous sharp market downturns. So let us start by examining our past responses to price crashes and examine the consequences of those responses. Below we look back on the industry’s typical responses to previous price drops and then provide information on how those responses have played out. The hope is that we can use the lessons from history and set forth an agenda to avoid making the same mistakes that have repeatedly thwarted industry-wide progress.

We first examine four broad categories, including our responses in those categories and the consequences. We then offer three areas where the courageous amongst us could do something different this time around.

Category 1: Projects

The most common category, and the one that attracts the most immediate focus, is projects. Projects are either delayed, slowed down, or in some cases outright canceled. Although in the short-run canceling a project may appear to be a rational move to manage cash flow, in the long run it is a detrimental decision (assuming companies still actually care about replacing reserves and production). Some of the more sophisticated companies, and certainly the ones with stronger balance sheets, may recognize the long-term nature of certain opportunities and continue moving those projects along.² A likely challenge to project teams will be to optimize costs. There are some key lessons learned here.



4 ¹Tim McMahon, “Historical Crude Oil Prices: Oil Prices 1946-Present,” Inflationdata.com. Updated April 8, 2020. Accessed April 16, 2020. <https://inflationdata.com/articles/inflation-adjusted-prices/historical-crude-oil-prices-table/>.

²Although recent announcements suggest this may not hold true for larger companies either.

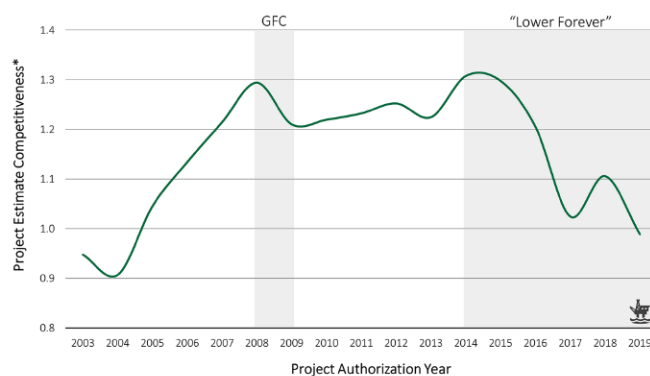
When the oil price crashed in the 2008-2009 timeframe, driven by the Global Financial Crisis (GFC), our projects were bloated, meaning we routinely oversized, over-scoped, and over-capitalized our projects. During that timeframe, challenging projects to become more competitive, lean, and fit to right-size the scope, was absolutely the right thing to do. Projects would routinely be scoped and estimated at twice industry norms.

The GFC-driven crash of 2008-2009 was Industry's first warning that oil prices would not stay high forever. A reasonable response then would have been to address the over-capitalization and over-scoping issues in a systematic manner. As Figure 1 shows, however, we barely made a dent—about a 10 percent improvement—but still 20 percent higher than the long-run average. We squandered our first chance. Six years later, in 2014, we faced another price drop, and the industry was right back where it was in 2008-2009. Except this time around, Industry realized it was entering a lower forever period. Some firms saw this as the right time to pivot the way projects should be done in the face of growing competition from shale, liquefied natural gas (LNG), and renewables.

Category 2: Supply Chain

The next most common area to go looking for cost savings is the supply chain. Similar to projects, the supply chain in the 2008-2009 timeframe had a lot of room to give. It is important to note, however, that during that timeframe, supply chain prices increased because of the demand in project activity. The oil and gas supply chain had been steadily weakening even prior to 2008, leading to high prices with increased demand, since enough capacity was not available. Since then, the supply chain has grown weaker still. Suppliers had to provide discounts and renegotiate contracts during the 2008-2009 timeframe, and in some cases, according to IPA data, supply chain costs decreased by 15 to 25 percent—more in subsea and FPSOs and, to a lesser extent, in other areas too.

But another significant consequence of our historical decisions has been that many players in the oil and gas supply chain either shuttered or divested from the oil and gas sector, including filing bankruptcy. Bankruptcies and divestitures that stem from these bad decisions continue to play out today. Sure, new yards in China have provided some diversification, but nevertheless the supply chain does not have enough capacity to meet the demand. In fact, as the COVID-19 pandemic has revealed, several industry projects fabricated in China or Far East yards



* Project estimate at sanction relative to industry benchmark
 icon represents the performance of the "Mover" companies identified at UIBC 2019

Figure 1: Project costs started trending down in 2015. Only the threat of long-term pain spurred action from some *movers*.

are now exposed to potentially cascading delays. Why? Because we all use the same few yards and, therefore, are constrained by the same few critical resources.

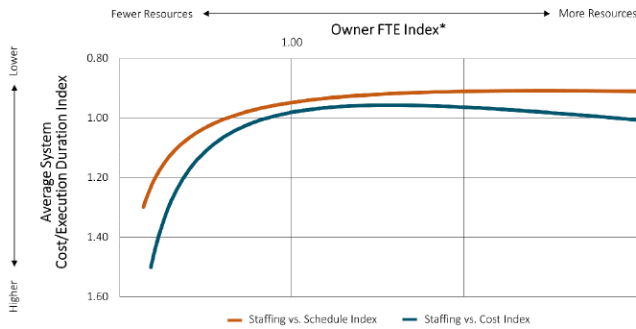
Challenging suppliers to cut costs under the "we are all in this together" narrative will not yield much effect. Yes, some suppliers can ostensibly provide some savings to owners in the short-term, but given the oligopolistic nature of many supply chain elements, these savings will be short lived and may, in fact, become premiums as soon as the activity rebounds. Furthermore, project delays are already going to make some suppliers and vendors vulnerable. If any more of them go bankrupt or leave the sector, it will make an already-weak supply chain situation dire. This is particularly true for smaller vendors, smaller fabricators, and engineering shops. So where we are now is that the market will not be able to give back a lot of costs, if any at all. It is fairly certain that, when the current crisis is said and done, the supply chain will become even more consolidated and weak. In the long run, the effective costs of our projects are likely to go up due to quality and capacity issues.

Category 3: People

So far, we have not seen mass layoffs in the industry—owners or suppliers—and this is a good thing. Remember, people do projects. In the past, price downturns in the industry caused projects to shed many people. (It is worth noting that IPA's Organizations and Teams practice is one of our busiest practice areas, because frequently we are called upon to help develop competency and capability plans.)

Decisions to downsize project capability in the past have created a long-term capability challenge. Companies have had a difficult time finding and/or developing the

³ Lucas Milrod and Sarah Sparks, "Making Intentional Staffing Decision to Preserve Core Owner Functions," Independent Project Analysis, April 3 2020, Accessed April 16, 2020, <https://www.ipaglobal.com/news/article/making-intentional-staffing-decisions-to-preserve-core-owner-functions/>.



* FTE Benchmark Using IPA FTE Database and Models For Given Portfolio Characteristics

Figure 2: At the portfolio level, systems with fewer owner staff pay more for projects and take longer to complete their projects.

skills they need, especially in core project capabilities.³ The weakness of competencies, skills, and capabilities is evident in the error rates in engineering drawings, quality issues in construction, and basic mistakes in quality assurance/quality control (QA/QC). Today, IPA is aware of a number of projects experiencing severe startup and ramp-up delays due to construction and engineering quality issues exacerbated by poor-quality QA/QC.

While taking a hard look at and potentially right-sizing staff (in line with a leaner and fit-for-future portfolio) is the right first step, historical decisions would suggest not much room is left to give on the people side of Industry in general. **Figure 2** shows having too many or too few owner resources can be detrimental to the cost and schedule performance of project portfolios. And decisions about capability made today based on the short-term outlook need to be taken seriously because they will have lasting effects as evident in the current environment. This is certainly true on the supplier side and even more of an urgent issue for them. Owners often pull from suppliers for the people/skills they need, leaving the suppliers vulnerable. Considering projects are fighting a shortage of talent across owners and suppliers, owners are increasingly facing serious issues in the form of quality problems in execution.

Category 4: Portfolio

Examining our portfolio makeup is a good place to look for cost savings for the long term. One way some leading UIBC companies improved their cost competitiveness was to take a hard look at the basket of opportunities they were pursuing and shed opportunities that had no chance of becoming competitive and profitable projects. Leading up to the GFC, development cost per barrel (\$/BOE) was creeping up to a point that we would routinely pursue opportunities 30 to 40 percent more expensive than the long-run

average. This never made sense but could be justified with the high oil price. But this behavior did not really abate until 2015 when some in the industry finally looked at the opportunity attractiveness issue.

An opportunity with great big reserves but that is in a very difficult location or under very challenging context is unlikely to become a competitive project; most oil and gas companies have such opportunities in their portfolio and now would be a good time to get rid of them. In fact, if there is any silver lining to this period, it may be that owners are forced to take a cold, hard look at projects and accept the stark reality that some opportunities are just not good enough. These projects have to be cut loose. Portfolio optimization is also the biggest opportunity to look for projects that can be done fast and competitively, and take advantage of the digital revolution. Also, owners may consider more standardized and repeat-type projects than one-offs.

Looking Forward

Given this historical context, what can we do today to improve capital investment outcomes? There are tools and responses available to us that work. Although these responses require companies to be courageous—and may even be contrary to what our peers are doing—they are not hypothetical. They have been used successfully in the past. Let's explore a few alternatives.

1. Projects—Most large projects in Industry take about 7 to 9 years from discovery to first oil/gas. One implication of this is that any project authorized in 2020 will not start up until at least 2024 or later. So, if a project is competitive, this would actually be a good time to continue with the project or at least position the project to be prepped and ready at the starting line. In doing so, as soon as the rebound occurs and pandemic-related constraints are lifted, these projects can move quickly and smoothly into execution. A consequence of not having this worked out—on a project-by-project basis—is that when a rebound does occur, everyone will want to get their projects in queue with suppliers, vendors, and yards, creating heavy demand on capacity that will lead to price spikes. In fact, this period might even be the right time to work with the supply chain to find symbiotic ways to keep the supply chain healthy, productive, and resilient. This will prevent current stresses from morphing into catastrophic issues. Remember several successful examples of collaboration with the supply chain and cooperation within the sector exist outside our Industry.

2. Improving Work Process Efficiency—While many in the industry worked hard to improve projects' competitiveness,

as discussed in earlier sections, the same cannot be said about schedule, especially early phase schedules. As an Industry, we are extremely inefficient between discovery and the end of scoping. The forced slowdown in our work actually serves as an ideal time to take a hard look at our work processes; stage gate requirements; deliverables; and, in general, the work and information flow in the front-end to identify opportunities for making the front-end more efficient. IPA analysis clearly demonstrates that most companies can harness 20 to 35 percent efficiency improvements in the front-end durations. To be clear, we are not advocating speed at the expense of robust gate packages. But our data are clear that information flow has become inefficient; while the underlying reasons are different in different companies, it is time we find ways to make information flow more efficient. It requires a lot of courage to reexamine the way we work. It will also require killing a few sacred cows and, more importantly, it will require a pivot from being simply deliverable driven to efficient flow of information driven. Data analytics and digitalization should help in this area.

3. Digitalization—Prior to the price crash, digitalization was everywhere; everyone was investing in new technology, all in the hopes of harnessing the productivity, efficiency, and agility in decision making promised by this new trend. (And yes IPA truly believes in the benefits of digitalization and the efficiency gains possible from it). Forced self-isolations and work-from-home conditions have put some aspects of digitalization to the test. IPA has heard from many clients that connectivity with colleagues, video conferencing in large groups, and general business continuity have proven the value of technology.

However, when asked whether digitalization has enabled better access to information for project teams or produced measurable improvements in productivity, enthusiasm is muted. The dark cloud surrounding our connectivity success is that many internal digitalization initiatives have only just begun. Complicating matters, there's a limited pool of capital for digitalization investments, which are also in competition with other projects and initiatives for funds. Meanwhile, some companies are being forced to face the reality that many solutions are not really delivering on the nirvana promised, not because these initiatives are failing but, rather, because some technologies remain immature and many digital initiatives lack clear, coherent objectives. And because of these unclear objectives, some digital initiatives are not progressing in the agile manner expected.

But why is it that over the past 30 years, we have seen zero improvement in engineering and construction labor productivity? The answer is in the data, which we do not

have. The challenge facing Industry isn't the pursuit of technology, it's the accessibility and quality of data that makes the technology useful and digitalization initiatives successful. What data we do have is hoarded away in silos—sometimes by accident, sometimes on purpose. Regardless, we need transparency. We need to see, in live data streams, why engineering is always late. We need to see, in live data streams, why construction tool time is 30 percent. Combined, these competencies make up half our project costs. Were we to improve our productivity in these areas by 10 percent, we would lower our CAPEX by 5 percent. Five percent is not a huge number, but it is doable, and if we really sort out the drivers of productivity through bonafide data, it is sustainable. So should we be slowing down or canceling our digitalization efforts? Of course not. But we do need to focus them on the levers that provide the most return. The courageous should take advantage of the extra time we have. Get the domain experience into a room together and hash out what is needed to answer these questions that have eluded us for so many years. In fact, now is the time to double our efforts in digitalization, not scale them back.

None of the solutions presented here are earth-shatteringly new or novel per se; they are novel in the sense that we have not usually tried them in prior crises. But hopefully they provide ideas and, more importantly, some context for our previous actions.

“Today is only one day in all the days that will ever be. But what will happen in all the other days that will ever come can depend on what you do today,” as Ernest Hemingway wrote in *For Whom the Bell Tolls*. We do not know exactly how long this crisis will last or how it will end. But if there is anything we know from the past crises and our response as an Industry, it is that we plant the seeds of the next crisis in today's crisis. The competency and skills problems, the weak supply chains, the difficulty of accessing our own information, and many other issues we face today are all problems we created for ourselves through our decisions in prior crises. The question facing us now is whether we will apply the same playbook of the past or be courageous enough to take this moment and really pivot and transform their organization completely by working to make the organization flexible, resilient, and adaptable to work in a non-traditional business environment.

Energy companies searching for direct and immediate guidance as to how they can strengthen their project portfolios and systems are encouraged to contact Neeraj Nandurdikar at nandurdikar@ipaglobal.com.



Making Intentional Staffing Decisions to Preserve Core Owner Functions

By Lucas Milrod, Deputy Director, Research, Organizations & Teams and Sarah Sparks, Product Development Leader, Organizations & Teams

During a company or industry downturn, or in times of great global fear and uncertainty, such as with the COVID-19 pandemic, capital spending reductions will move some companies to consider project organization and team staffing changes. IPA recommends patience and perseverance during such times. Decisions to eliminate owner organization positions in particular can carry lasting unintended consequences. It is not easy to rebuild owner-led project leadership capability through development or recruitment once that capability has been diminished.

IPA research has long established that adequate owner staffing is critical to capital project success. For individual projects, teams with sufficient owner staff are more successful at producing quality information during project definition and thereby achieving better front-end definition (measured through IPA's Front-End Loading [FEL] Index) than contractor-led or understaffed teams. Strong owner teams deliver projects at an average of 25 percent lower cost than contractor-led or understaffed teams. But when capital investment slows down, companies can be tempted to take drastic measures to cut costs, including eliminating owner personnel and/or entire competencies within project organizations.

The key to successfully adapting to slowdowns in capital investment is being strategic and intentional about how owner staffing changes will affect project risk in the short- and long-terms. A few important questions can help dictate an organizational strategy. They are:

- Can all project staff be kept and, if so, how do you make the most of their time when there are not enough projects for them to work on?
- How does an organization set priorities for maintaining certain staff and capabilities?
- How can the short-term cost of maintaining staff/capability be weighed against long-term viability and capability needs?

The answers to these questions can serve as the basis for an organizational strategy that can provide guidance in tumultuous times.

Top Priority: Maintain Core Competence in Key Functions to Support Adequate Owner Control on Projects

Even outside of uncertain and/or difficult conditions like COVID-19, many project organizations are limited in their ability to achieve the robust owner staffing they desire simply due to the difficulty in justifying the cost of acquiring and maintaining the resources to their businesses (despite the research previously described that shows the benefits of such staffing). IPA is commonly asked: "If I can't have all the resources I need, what should be my priority? Are certain functions that are particularly leveraging for project success?" The answer is yes, there is a set of competencies IPA research shows to be core to project systems. At a minimum, these core competencies should be retained to ensure project organizations are capable of delivering effective projects once work picks back up.

While IPA has routinely shown that sufficient owner staffing across all functions is key to effective project development and execution, ultimately, it is critical for an organization to enable owner teams to maintain adequate owner control. Assuming that scope development competency is housed in the businesses, core functions that facilitate value creation in projects include project management, engineering disciplinary leads, construction management, project services (cost estimating, scheduling, controls),

and procurement and contracting. In the absence of any one of these functions, a project team relinquishes too much control to contractors and consequently project performance suffers; teams lacking owners across these functions have great difficulty achieving high-quality project definition and ultimately deliver projects that are on average 22 percent more expensive than those teams that have owners staffed across these functions.

For each of these functions, however, a range of roles and capabilities exists. We can explore the baseline owner capability required to maintain owner control and minimize project risk, which has implications for the baseline functional competency requirements at the organization-level.

Project Management

To develop and execute a successful portfolio of projects that meet the owner's objectives with respect to operability, cost, and schedule, the project management function must be strong within the owner organization. This role is critical to orchestrating the project team to achieve good quality definition and controlled execution while simultaneously ensuring the project is done in alignment with the owner's interests and objectives. This function (as a whole) cannot successfully be outsourced without introducing significant risks to the owner organization.

Engineering

The engineering function is one heavily influenced by company and organizational strategy. However, at a minimum, owners must have strong engineering management, particularly for larger projects, to control engineering hours and ensure designs are developed in alignment with the owner's requirements and per contractual agreements. This means that companies need to have the ability to provide lead engineers for every project and, for major projects, lead engineers for each discipline that will be required for the project. The disciplinary leads will be the organizers of design review, which is even more important in today's world of weakened EPC companies.

Construction Management

Similar to engineering, an organization's construction competency as an overall function is heavily influenced by strategy. However, to ensure high-quality definition, the owner must be capable of providing early input about constructability and safety. Furthermore, the capability to monitor construction productivity and progress relative to plans can facilitate identifying issues early enough that they can be mitigated. The construction manager's role in ensuring project safety is imperative.

Project Services

Cost estimating, scheduling, and project controls are often lumped under a single umbrella. Regardless of the overall title for this group of functions, these functions represent a conflict of interest when performed solely by contractors without any checks. Below we describe the minimum core capability for each of these three functions:

Cost Estimating: Teams need the capability to at least validate contractor cost estimates; this helps ensure the estimate is reasonable (i.e., verifies materials quantities) and the planned schedule fits the estimate. In addition, this capability can help identify if the scope is poorly defined.

Scheduling: Like cost estimating, the minimal capability required for the scheduling function is the ability to validate schedule feasibility and independently assess project progress. The ability to validate contractor schedules throughout bid evaluations helps identify where the schedule is not on target with the bid, indicating the contractor does not fully understand the project scope and is unlikely to provide an accurate cost estimate. The ability to assess project progress provides the owner with more transparency and the ability to know very early if a project is going off track. A competent scheduler can assist with equitable adjustments on changes and reduce the number of costly contractor claims.

Project Controls: A strong owner capability in project controls is critical throughout the life of the project, starting in FEL 2 to ensure engineering hours can be controlled; design progress is as advertised; design and construction conform to sponsor requirements; contracts, estimate, and schedule are consistently developed and will support controls during execution; and a change control mechanism or program is in place. This function is critical during execution to monitor and control changes and explain the cost of changes to estimators.

Procurement & Contracting

Owner input is required to support the project team in developing the procurement plan, conducting pre-qualification and contracting discussions, negotiating terms, and ordering long-lead items. Their involvement beyond this minimum capability largely depends on the procurement approach and contracting strategy. A corporate procurement function will most likely always exist—the key here is to make sure enough capital project savvy procurement and contracting representatives who can provide timely input to projects in the capital portfolio remain in the organization.

As mentioned for several of these functions, varying levels of capability are possible. For example, some companies maintain the ability to build their own cost estimates in-house. However, for this strategy to be effective, estimators need to have the skills to do this and the organization needs to provide them with the tools necessary to support building quality estimates including a database of information to leverage.

In addition to the key functions mentioned above, companies must retain additional functions in-house. For example, does the company retain discipline engineers? What about process engineering capabilities or deeper construction support/expertise than overall oversight?

To Each Their Own Staffing Strategy

The staffing considerations detailed above should provide guidance to businesses and project leaders about how to prioritize staffing needs and tradeoffs; the staff required in each competency area to maintain baseline capability; and the appropriate balance of owners and contractors

in each competency area, including what, if anything, can be outsourced.

A clear organizational strategy establishes guidelines for navigating these difficult decisions. If circumstances have changed enough, it may necessitate a change to the strategy, but this should not be a knee jerk reaction. Project teams with the right mix of owner personnel in key functions are more likely to establish a clear vision, strategy, and approach for planning and executing projects; ensure complete and timely inputs into the information process across all functions; and provide appropriate contractors oversight.

Each organization must determine which competencies are core to their business beyond these. Establishing this organizational strategy provides the basis from which informed decisions can be made about staffing.

Contact Lucas Milrod at lmilrod@ipaglobal.com or Sarah Sparks at ssparks@ipaglobal.com to discuss your organization's staffing strategy.

Staffing E&P Industry Projects for Success: Oil and Gas Operators Invited to Participate in Study

The COVID-19 pandemic has the oil and gas exploration and production (E&P) industry facing another downturn. In the wake of the historic oil price crash in April 2020, operators may once again be tempted to severely reduce staff in an effort to cut costs in the short-term, as was the response to the global financial crisis in 2008-2009 and the oil price drop in 2014. However, repeating the mistakes of the past will severely weaken operators' ability to deliver successful projects in the future, as IPA research has shown that strong owner teams deliver projects at an average of 25 percent lower cost than contractor-led or understaffed teams.

But, what exactly does the optimal E&P staffing strategy look like in the lower forever oil price environment? IPA and four major oil and gas operators have developed a framework to answer this question through research. Additional E&P organizations interested in implementing optimal staffing strategies that leverage owner competencies, suit the project context, balance owner costs, and ultimately promote project success are invited to join the study.

More Information

For those interested in learning more about the study, IPA can share more detailed information on participation requirements, the deliverables each company will receive, and the key questions each study phase will address. Contact Jon Walker at jewalker@ipaglobal.com to request more information.

COVID-19 and Turnarounds— Panicking or Planning?

By Andras Marton, IPA Manager, Hydrocarbon Processing & Transportation, Katherine Marusin, IPA Product Development Leader, Site & Sustaining Capital, and Patrick Voogd, IPA Senior Consultant

In many of the same ways that the COVID-19 pandemic has upended our daily lives and the way we work, the virus is having a dramatic effect on capital projects of all sizes, from megaprojects to smaller site-based projects. Lockdowns and social distancing measures are disrupting the fabric of business, project organizations, and contractor interactions that are essential to project planning, engineering, and field work. However, although much has been said and written in the past weeks about the postponement and cancellation of capital projects worldwide, we see much less attention being paid to how COVID-19 is impacting critical site and unit maintenance activities, especially turnarounds (TARs).

Under normal circumstances, TARs require a significant headcount on site. The labor increases required to bring production back online in a limited time frame obviously have profound implications for safety in the midst of a pandemic. In response, companies are delaying or changing project scopes, depending on the criticality of the planned work. Because turnarounds are critical and cannot be put off indefinitely, they give us an early look at how projects are coping with COVID-19-induced changes.

IPA has been checking in with its clients during these unprecedented times to understand how they are addressing the many challenges confronting project professionals during the COVID-19 pandemic. Through our discussions and surveys with turnaround professionals, we investigated what actions companies are taking to address the difficulties of working during a pandemic. We found that they have taken a range of actions, some with potentially long-term advantages for turnarounds as well as for larger projects. Below, we summarize our observations to date.

COVID-19 Considerations for Turnarounds

The COVID-19 pandemic means that decisions to move ahead with turnarounds must factor in social distancing measures imposed by various governmental authorities, the complexity and criticality of the turnaround itself, and the willingness and capabilities of the regulatory agencies to be flexible on timelines. Consequently, local decision makers have developed the response for

most sites, in accordance with corporate guidelines and directions. Central project organization expertise is also often leveraged. The most common measures reported involve changes to the capital portfolio, modifications (usually reductions) to the turnaround scope, and execution approaches aimed at ensuring safe execution with minimal disruptions.

Portfolio Changes—Decisions around the turnaround portfolio are almost always developed in close coordination with regulators. To ensure the safety of all involved, sites must use appropriate practices, tools, and planning to put social distancing and hygiene measures in place. Although many sites report a close working relationship with regulators, site project personnel are almost always finding that regulatory agencies cannot respond as effectively as usual because they are overwhelmed with requests for changes.

Most site personnel surveyed reported that they are already dealing with significant turnaround delays and that they anticipate additional scope and execution approach changes in the coming months. The exceptions were outages requiring smaller crews to address critical maintenance that were in or near field execution. At a handful of sites located in regions with minimal or contained COVID-19 cases, work is expected to continue as planned, with the most substantive changes being made to safety practices. Under the best of circumstances, reprioritizing work in site portfolios is arduous; optimizing them during the pandemic is proving to be even more complicated as sites attempt to identify the most critical scope and the right timing for that work to be done.

Scope Modifications—Although the pandemic has affected engineering, most of the challenges are in the field. In the regions most affected by COVID-19, a common approach to managing turnarounds that cannot be delayed or deferred involves removing capital project scope from turnaround worklists and focusing on “mission critical” scope only. According to IPA’s survey respondents, cuts to scope range from 20 to 40 percent. Interestingly, these scope reductions do not always mean that there are associated reductions to the outage duration, as social distancing measures lead to lower labor densities. Even when the TARs are well planned, most sites are expecting poorer than normal labor productivity as well.

Execution Modifications—Most companies report modifying turnaround execution plans. Some reported planning for different scenarios to facilitate changes in execution strategies in the event that high probability and high effect risks materialize. These plans usually involve

different work front arrangements, spreading labor over the available work area, and staggering work shifts. Some of the plans even involve deliberate learning opportunities to understand how these various execution plans actually affect the ability to do productive work.

An Eye on Safety

While some sites are simply extending established safety practices, others are developing whole new philosophies for approaching turnarounds during the crisis. Most of the safety-related focus is on physical distancing, site personnel told IPA. They cited visual aids and physical barriers to keep people safe distances apart, expansions of support facilities to create room for spacing out crews, and additional considerations to promote and facilitate good hygiene. IPA learned that full personal protective equipment is being considered in only a few extreme cases. Managing physical distancing is the most challenging during activities like moving crews between parking lots and work areas and from one work site to the next. Some organizations are reworking their plans to minimize crew switchovers and to minimize the number of interfaces between the different shifts. Of course, the regular sanitization of common areas and transportation is also common.

Weakened Supply Chains

Some sites are very concerned about their supply chains. Although locally sourced materials have not been an issue so far, sourcing from major vendors located overseas is perilous, as deliveries are delayed significantly—or even cancelled. In general, the longer the supply chain, the stronger the potential negative effects of the pandemic. The most common reaction has been to shorten the supply chain and re-source from a closer location to minimize the transportation and logistics risk. However, this is not always possible, as some of the critical materials can only be sourced from a few manufacturers. We are finding that companies are almost always addressing these high risk and long supply chain issues proactively rather than waiting for issues to surface.

Additional Insights

A clear advantage for some of the surveyed sites was the availability of capital project personnel whose projects were put on hold. These professionals now find themselves in a position to provide support to turnarounds, particularly in the areas of safety planning and redeveloping schedules and execution plans to reflect current (and potential) circumstances.

As part of our discussions with sites, we also observed that companies with advanced *digitalization efforts* reported having an easier time coping with the disruptions and maintaining effective communication channels. Beyond conducting effective virtual meetings, tools developed specifically to communicate project-specific information between team members were of particular value, as they effectively replaced in-person interactions. These tools provide an advantage in transferring information between the crew in the field and functions located elsewhere, such as engineering, operations, and project controls. Some of the survey respondents also pointed to the use of digital tools as necessary to ensure hygiene and distancing standards because they replace the need for physical items, like forms, to be passed around.

What Lies Ahead?

Opinions varied on the cumulative effect of the COVID-19 pandemic on capital projects and turnarounds. About half of those we interviewed expect major coronavirus-related setbacks to be over by the fall of 2020; the other half is preparing to mitigate COVID-19-related issues into 2021. Most, however, indicated that if current conditions continue into the fall, they will have to make drastic changes to their overall approach, including extended plant-wide shutdowns. The resurgence of the pandemic (a “second wave”) is also considered a real possibility. Most companies report being “very concerned” about significant disruptions from a potential second wave of infections with some only being “somewhat concerned.” The respondents voiced a common concern that when circumstances return to normal, a large wave of deferred turnarounds will create a temporary heated market.

Industry still has a long way to go to figure out on the best way to cope with the disruptions caused by the pandemic, but it is clear that companies are already expending significant energy and effort on planning. Turnarounds that are currently in the field provide a unique opportunity to learn about human behavior, to figure out what works and what does not, and to reveal the main pain points that require more attention. Effectively collecting these learnings and transferring the knowledge to the overall organization will not only help the next wave of turnarounds, but will also benefit capital projects and other parts of the organization.

Contact Andras Marton at amarton@ipaglobal.com for more information on how IPA can assist companies with their turnaround projects in the post-COVID-19 landscape.

Tank Maintenance Benchmarking to Improve Cost and Schedule Performance

By Josh McClellan, IPA Advanced Associate Project Analyst

Companies in the petroleum, petrochemicals, and transportation sectors have suddenly found themselves reassessing their storage capacity, thanks in no small part to the COVID-19 pandemic and the global oil supply glut. For tanks taken offline for maintenance, execution cost and schedule effectiveness are imperative given the pressing storage demand and capital expenditure cuts. Tank maintenance benchmarking is the key to reducing the cost and outage time for these projects.

What many owners lack, however, are reliable metrics to measure the cost and schedule performance of their tank maintenance projects. To identify opportunities to reduce costs and minimize out of service durations, companies need to compare their tank maintenance projects with industry-wide norms for cost and schedule competitiveness. But data curation for tank maintenance activities requires time and experience that can be challenging to come by.

In 2014, IPA undertook a concerted effort to establish key metrics owners can leverage to gauge the cost and schedule competitiveness of their tank maintenance portfolios. The research was based on detailed data from hundreds of tank maintenance project evaluations conducted by IPA. In conducting the tank maintenance research, IPA also ascertained organizational and project management Best Practices that correlate with project performance improvements. Tank maintenance professionals shared valuable insights into the planning, development, and execution of tank repair and upgrade work with IPA.

IPA continues to update the tank maintenance benchmarks. During 2019, IPA benchmarked eight of the world's leading companies in the petroleum, petrochemicals, chemicals, and transportation industries, providing data on more than 300 new tank maintenance projects. These benchmarking studies included tanks holding from 10,000 to 600,000 barrels of crude, gasoline, diesel, or other chemicals. These projects have been executed globally, with costs ranging between US\$0.01 million to US\$7 million. Cleaning, inspection, waste

disposal, repairs/upgrades, internal and external coating, and recommissioning cost and schedule data were benchmarked against Industry.

These benchmarking studies also took a closer look at the composition of organizations responsible for carrying out these projects. For example, even though about 70 percent of companies assign a project control specialist to tank maintenance projects, only half assign a full-time site construction manager to the projects, resulting in significant cost performance differences.

These projects have significant opportunities for potential cost savings and improved schedule performance for most companies, especially as demand for oil, petrochemicals, and other chemical products may be slow to increase as the coronavirus pandemic takes its time to unfold.

To learn more about IPA's tank maintenance benchmarking and related capabilities, please contact Josh McClellan at jmcclellan@ipaglobal.com.

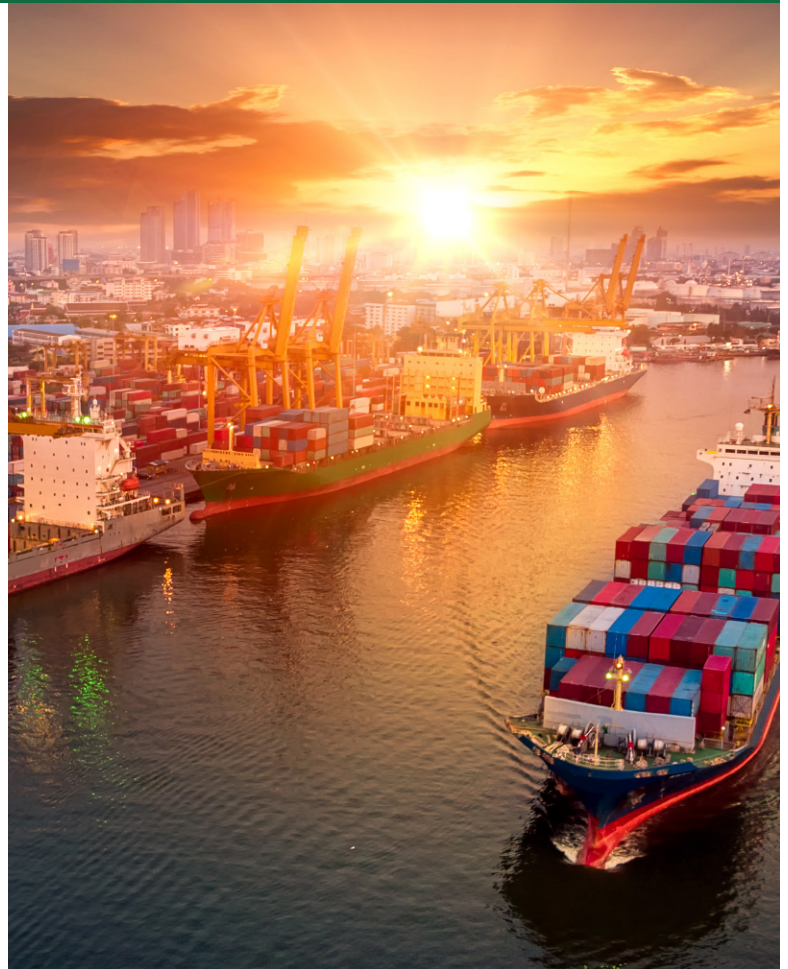


How the Capital Projects Industry is Responding to COVID-19 (Latest Report)

Recorded Webinar Shares New Information From IPA's Ongoing COVID-19 Industry Survey

How is the capital projects industry responding to the COVID-19 pandemic? IPA continues collecting data via its ongoing COVID-19 industry survey. At the beginning of April, IPA Principal Deputy Director of Research, Jason Walker, shared initial responses to IPA's industry survey addressing supply chain disruptions, effects on internal operations, portfolio implications, and mitigation strategies. A month and a half later, 2020, Walker hosted a follow-up webinar to provide new and updated responses.

A recording of the webinar and a PDF copy of the presentation slides are available at www.ipaglobal.com.



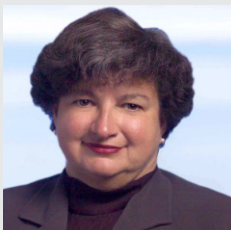
IPA Announcements



Brad Lough
IPA CFO

IPA Hires Brad Lough As Its New CFO

IPA is pleased to announce that Brad Lough has been selected as its next Chief Financial Officer (CFO). Lough succeeds Ken Ingersoll, who retired after serving as IPA's CFO for nearly two decades. Lough now oversees IPA's treasury, accounting, budget, tax, and audit activities as well as the financial and account system controls and standards. He is also responsible for creating financial and statistical reports for management and/or Board use and preparing monthly, quarterly, and annual reports and accounts.



Mary Ellen Yarossi
IPA Board of Directors

Mary Ellen Yarossi Rejoins IPA Board of Directors

Mary Ellen Yarossi re-joined IPA's Board of Directors in May 2020 after previously serving from 1994 to 2016. Yarossi began her IPA career in 1989, filling a variety of positions over the years, including client coordinator for DuPont, IPA's first major client. She helped run the Industry Benchmarking Consortium (IBC) for several years and served as Chief Operating Officer through much of the 1990s.

Visit www.ipaglobal.com to read the full announcements.

IPA Institute

Courses Resume Online

IPA Institute courses have officially resumed with **Webex Training**, a virtual classroom platform, being used to support online courses. Not to be confused with webinars, which mostly consist of one-way delivery, the new IPA Institute online trainings require the participants to think, consider, reflect, and respond to the content presented. The IPA Institute has designed these new online courses to be highly interactive, with some level of interaction every 2 to 5 minutes. Four courses are now available in the new online format:



Front-End Loading (FEL) and the Stage-Gated Process

Project professionals gain an understanding of the elements needed to drive better outcomes in safety, cost, schedule, and operational performance. The course is delivered online in two 2-hour sessions.



Capital Project Execution Excellence and Project Controls

Participants learn the project controls Best Practices that drive Execution Excellence and help deliver competitive and predictable capital projects that meet business objectives. The course is delivered online in two 2-hour sessions.



Leading Complex Projects: How Do You Compare to Successful Project Leaders?

Based on groundbreaking IPA research that statistically links leadership characteristics to success, project leaders find out where they stand in comparison and how to close the gaps. The course is delivered online in two 2-hour sessions.



Project Management Best Practices

Participants emerge from the course with an understanding of how to implement the learnings to improve the way their organizations plan and execute mid-size to large capital projects. Practical tools are also provided for project professionals to take and use in their daily environment. The course is delivered online in five 4-hour sessions.

The IPA Institute's first online sessions of *FEL and the Stage-Gated Process* were delivered May 19-21 (U.S. Eastern time zone) and May 27-29 (Singapore time zone). Both May classes were sold out, necessitating a third class that took place June 2-4.

All four new online courses will be held over the coming months. View the schedule listed to the right and visit www.ipaglobal.com/events for more information and to register.

THE IPA INSTITUTE

Advancing Project Knowledge

Online Courses

Due to COVID-19, The IPA Institute is focusing on delivering online courses in 2020 instead of in-person courses. View the full online course schedule at www.ipaglobal.com/events.

JUNE

29-1 Capital Project Execution Excellence and Project Controls
10 a.m. to Noon
US Eastern Time Zone

JULY

6-8 FEL and the Stage-Gated Process
1 p.m. to 3 p.m.
Gulf Standard Time Zone

7-9 FEL and the Stage-Gated Process*
10 a.m. to Noon
Chile Standard Time Zone
*Instructed in Spanish

14-16 FEL and the Stage-Gated Process*
10 a.m. to Noon
Brasília Time Zone
*Instructed in Portuguese

21-22 Leading Complex Projects: How Do You Compare to Successful Project Leaders?
10 a.m. to Noon
US Eastern Time Zone

AUGUST

24-2 Project Management Best Practices
9 a.m. to 1 p.m.
Australian Western Time Zone

IPA Events and Presentations

Due to the COVID-19 pandemic, the 2020 meetings of the Upstream Cost Engineering Committee (UCEC) and Cost Engineering Committee (CEC) will take place entirely online. IPA is actively discussing plans for the Upstream Industry Benchmarking Consortium (UIBC) with member companies and is preparing for an online meeting should in-person attendance not be possible at that time.

Upstream Cost Engineering Committee (UCEC)

June 23-July 14, 2020
Online Meetings

The UCEC strives to improve upstream project and business results by providing metrics for better cost engineering. Member company representatives gather once a year to learn about and review new UCEC metrics packages prepared by IPA. The upstream metrics packages are used by companies to compare their upstream project cost and schedule outcomes with industry cost and schedule norms and, in general, boost business project estimate assurance and evaluation quality.

Making Smart Resource Decisions in the Midst of a Crisis

June 24
Free Webinar

Many companies are considering headcount reductions to lower costs during the COVID-19 pandemic. Although sometimes necessary, headcount reductions have historically done serious, long-lasting damage to industry capabilities. To deliver projects effectively when capital work resumes, it is imperative that owner companies make smart decisions now with regard to resource cuts. Sarah Sparks, IPA Product Development Leader, Organizations & Teams, will lead a free 1-hour webinar sharing key project organization staffing data and information needed for smart decision-making. Sessions take place on Wednesday, June 24 at 10 a.m. and 9 p.m. U.S. Eastern Time. Visit www.ipaglobal.com/events to register.

Cost Engineering Committee (CEC)

September 22-23
Online Meetings

The CEC is a working subcommittee under the Industry Benchmarking Consortium (IBC) that assists cost engineers by providing metrics and tools that offer an unbiased snapshot of industry cost and schedule estimates and trends. The CEC focuses on all aspects of cost (or investment) engineering, including cost estimating, scheduling, and project control practices and metrics, with the goal of expanding the owner cost engineer's capabilities. The primary vehicles for accomplishing these objectives are validation metrics, Best Practices research, and practice sharing.

Upstream Industry Benchmarking Consortium (IBC)

November 16-18
Leesburg, Virginia

The UIBC is solely dedicated to the exploration and production (E&P) industry. It provides an independent forum for each participating company to view key metrics of its project system performance such as cost and schedule, Front-End Loading (FEL), and many others against the performance of other companies and share pointed and detailed information about their practices. The consortium highlights Best Practices, reinforcing their importance in driving improvements in asset development and capital effectiveness.