An International Leader in Business Success Through Innovative Project Management Solutions for over 40 years!

Winter 2015 Issue

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Strategic Planning - A Combination of Need & Capability Part 5

Metrics and Benchmarking

Most of the organizations that Pathfinder has worked with, have been involved in some type of benchmarking effort in the past 20 years as part of an effort to improve capital productivity and strengthen the link between the Business Strategy and Operating Results. For some unknown reason, it appears as though some have been deluded into believing that certain performance metrics are the singular answer to performance improvement. Moreover, we continue to see less than satisfactory performance on strategic projects where metrics predicted favorable results. Why?

Capital project effectiveness can only be achieved when the organization, the process and the project are all heading in the same direction. Integrated metrics must be a part of a directed strategy or else the emergent strategy will consist of fragmented metrics that lead to competing interests and ultimately less than optimal organization performance.

For almost any company, you cannot apply a cookie cutter solution for metrics. Like people, companies are different, projects are different. You have to ask yourself what your company is about, what business you are in, what your strategy is and what you are trying to achieve with the project in the short-term as well as long term. When comparing the vast array of business models, individual project objectives and types of projects, you may find that benchmark comparisons have more to do with the consultant's statistical magic than the ability to benchmark projects that are truly comparable and predict results. If metrics were medicine, the FDA would be giving close scrutiny to the claims made for the results of these performance measures.

You do not want performance metrics that will distract your project teams from the business opportunities that the project is intended to address. "Leading" metrics such as tracking alignment with the business goals throughout the project lifecycle keeps project teams from distraction. If the business people aren't happy, front-end loading indices, on-time delivery and good budget controls ("lagging" metrics) don't really matter much.

Pathfinder Commemorates 40 Years of Business Success Through Innovative Project Management Solutions

Pathfinder was established in 1975 as a totally independent project management consulting and training firm specializing in project planning and execution in numerous industry sectors across the globe. Our services cover all aspects of project planning and execution, from strategic planning to start-up, from concept to production. Our clients are assured business success through innovative project management solutions facilitated by our seasoned staff. Pathfinder's experience and expertise

can generate a capital cost and schedule certainty on new or retrofit, small to mega-scale projects, as well as similar outcomes on routine outages to large, complex turnaround projects.

Pathfinder has provided support to over 4,100 projects representing over \$625B worth of capital investment.

Visit our website to view our historical timeline.



Strategic Planning continued...

Leading metrics must be an integral part of the process measurement. A key feature of leading metrics is updating the status of the metric throughout the project lifecycle. The best leading metrics measure performance, that is to say, the quality of the output or deliverable from the organization, the process and the employee – not merely that the deliverable was produced. What benefit is it if you produce all of the required deliverables and the quality control mechanism cannot detect or ascertain the quality of the critical dimensions of the deliverables? Without a thorough understanding of the quality of the deliverables, it is impossible to understand the risks and develop corresponding risk management plans to ensure project success. On strategic projects this should be a requisite because these projects are a vital link to business performance.

Lagging metrics should also be a part of your process. As practitioners, we can attest to the value of front-end loading indices, as well as the standard project indices such as cost, schedule, etc. However, lagging metrics should be tied to all organizational levels of performance and integrated – if they are to be valued.

When considering project metrics, think of this analogy: Just as hitting a good golf shot depends more on how you strike the ball than which brand of club you use, achieving success using any performance metric will depend on how well you apply it, rather than which one you use. Once you have the ability to strike a golf ball you need to be able to choose the right club based upon your situation. Similarly, you will need to know which metrics are appropriate for your evaluation of your individual situation.

Successful companies are the ones that deliberately choose a set of metrics that deliver a unique mix of values, so they meet overall organizational objectives and support individual project situations. Leading measures provide value to individual projects by facilitating successful outcomes. Lagging measures provide value to the organization by providing feedback on the overall system performance.

Conclusions and Recommendations

Benchmarking has brought attention to the deliverables produced as part of the process, but it has not been proven to radically improve the performance of any project delivery system. Owner companies have spent millions of dollars creating elaborate work processes and procedures to produce the deliverables sought within the benchmarking efforts. Many of these same companies have benchmarked well against their peers, yet have not been able to achieve or sustain business or project performance improvements.

Pathfinder's work using the PM³ methodology has accelerated organizational improvements that have proven to be sustainable. This is because the model and its application address the fundamental laws of capital project organization systems:

1. Organization systems deliver results that are constrained by the lesser of the three key dimensions of project management maturity – process goals (environment), process management

- (organization, personnel and competencies), and process design (documented methodologies, tools and reinforcing elements).
- 2. Organization systems adapt or die. The success of the survivors depends upon the speed and effectiveness in which they adapt to changes in the environment and internal operations.
- 3. Organization systems are only as capable as the weakest link in the supply chain.
- 4. When one component of an organization system optimizes, the organization often sub-optimizes.
- 5. Effecting changes in any dimension of an organization system will have an impact on other parts of the system. You can't just provide training, reorganize, and develop procedures, as if you were adding spices to soup. Each of these actions may impact the recipe.
- 6. Project organizations behave as a system, regardless of whether it is being managed as a system. If the organization is not being managed as a system, it is not being managed effectively.
- 7. Bad organization systems will prevail over good people almost every time. Often companies spend too much time fixing people who are not broken and not fixing the limiting dimension of the system, whether it be the process goals, process management, or the process design.

We, at Pathfinder, are capital project improvement practitioners. We find the PM³ methodology and model useful because it enables our clients to understand the variables that impact the results and identify tactical strategies and implementation plans that will improve performance on a sustainable basis.

Safety Corner

Commercial buildings are just as susceptible to fires as residential buildings are. Employers are responsible for the safety of their employees when it comes to fire. They are responsible for maintaining sprinkler systems, guarding against fire hazards, and creating emergency plans.

Fires can be even more of a hazard at work than in the home. Workplaces can be crowded. If panic ensues, co-workers might actually cause each other harm in their rush to escape. In addition, work environments are new for many employees who may not be familiar with escape routes and safety equipment. Finally, evacuations can be dangerous because there are so many people who might make poor decisions. It is best to make a management-level employee responsible for fire safety. Working with subordinates, they should create an emergency plan. Education is the key to preventing injury or death from fire. Walk employees through safety procedures. When a new worker starts, take the opportunity to review escape routes and procedures with the entire staff. Exit signs should be posted in easy-to-see spots for guests and customers.

Update safety information regularly. Check fire extinguishers to see when they need to be serviced or replaced. Inspect old buildings, updating and maintaining electrical systems.

If work stops because of a fire, employees should be eligible for unemployment insurance. Have the fire department inspect your building before and after any remodeling.

Tips taken from SafetyResource.com

Top 6 Construction Risks Facing Petrochemical Projects

Petrochemical Update caught up with Sr. Project Experts at, Ineos, Jacobs Engineering, Linde, Deloitte and Pathfinder — to get their views of the challenges facing planned petrochemical facilities in the USA right now.

With planned capital investment surpassing \$100 billion for new petrochemical projects in the USA, it's no wonder that many projects are facing time delays and cost overruns, due to high demand for 'materials' and 'workforce' on increasingly complex projects.

Key benefits of downloading the whitepaper:

- Offers practical solutions on how to allocate and manage risk on projects, including: operational, contractual, financial, design, geopolitical, and legal risk
- Key analysis which can help owners and contractors deliver their petrochemical projects on time, and within budget

Pathfinder's Steve Cabano is moderating a discussion that addresses these risks at the Petrochemcial Engineering & Construction Conference in 2015.

PANEL DISCUSSION:

Leading Petrochemical Companies Identify Risk for Successful Front End Planning

Moderator: Steve Cabano, President, Pathfinder

- Thoroughly evaluate project risks early on as to avoid harmful impact to future project timelines, and overall project costs
- With a nationwide 'gap in knowledge and experience' in brainstorming for FEL 1 and FEL 2 stages, hear what these companies are doing to manage and

identify project risk, resource needs and contracting strategy in today's market place

• Expert insight into the 'unknown' project risks facing petrochemical projects in today's market place; how to identify these risks, what they mean for your project objectives and how to mitigate their overall impact

Panel Members:

Nathan Heimeyer, Staff Project Manager, **TPC Group** Scott Gordon, Project Assurance Manager, **LyondellBasell** Nigel Carling, Project Director, **Chevron Phillips Chemical**

Keynote speakers you can expect to hear from at the show are from the following companies: Sasol - The Dow Chemical Company - BASF - LyondellBasell - TPC Group - Fluor Corporation - Shell - Louisiana Chemical Association - Jacobs Engineering

PETROCHEMICAL

Top 6 Construction Risks Facing Petrochemical Projects: Industry Whitepaper

Get your free 'Project Risk' whitepaper here





Deliver Your Petrochemical Project on Time & Within Budget

Offers practical solutions on how to allocate and manage 'risk' between Owners & Contractors for successful project execution

Project Management POTLIGHT

Invaluable Investment Support

Pathfinder's independent project review support has become invaluable in assisting investment bankers and private equity firms recognize cost-effective project ventures. These reviews provide investors, who are potentially



inexperienced in capital project planning and execution, with high quality information so they can make educated business decisions. Pathfinder provides the link between the technical and execution pieces of a project with the business side.

40 years of experience allows Pathfinder to successfully identify the following key aspects of project cost and schedule expectations...

- Economic assessment on the tradeoffs between capital cost and operational flexibility
- Cost/Schedule Risk Analysis probability of hitting established targets
- Status updates to keep project on track
- Contractor evaluation selecting the best contracting option and contractor
- Scope Management assure the project does not assume scope beyond what supports the business objectives

Independent reviews also provide project execution recommendations relating to bringing projects that have diverted from their execution targets, back on track. These reviews are executed in a 4 – 6 week time period and provide quick, accurate project information for analysis and action.

Obtain a clearer picture of your project's investment success potential, contact Brett Bailey at consulting@pathfinderinc.com for more information.

Follow **Pathfinder, LLC** on LinkedIn to get the latest news about us, where we are presenting, and discounts on training. Click the logo to go directly to our LinkedIn page then select the "Follow Company" button on the top right side of our page.



Pathfinder - Around the World



Nat Schatz (photo credits) and Jim Cravens (center) conducted Post Project Review Interviews at Kraton's Semi Works Plant project in Belpre, OH in October of 2014. Also pictured are Mike Ross, Project Manager, Kraton, and Mark Mckarinin, Lead Process Engineer, Kraton.

global experience... local knowledge



Jim Blevins and Jimmy Cravens facilitated the development of a Project Execution Plan for a mega project in the Gulf Coast. The two are seen here brainstorming in Houston, Texas on February 10th, 2015



Jimmy Cravens and Jim Chiarello facilitated the Project Management Training pilot for Husky Energy in Lloydminster, Alberta, Canada the last week in January

Executing Oil/Gas Projects when Oil Prices Drop to 50/bbl

As the price of a barrel of oil tumbles more than 50%, from about \$100/bbl to less than \$50/bbl, the return on investment calculations become radically different than they were just 6 months ago. In today's highly volatile world of oil and gas capital project spending, especially in the Upstream Industry sector, CAPEX has become paramount. When oil prices are more than \$100/bbl the primary driver for the project is time to market. Capital inefficiencies are more than offset by the high margins. Today at less than \$50/bbl, much more attention and scrutiny of the CAPEX is necessary, as the time to achieve returns on the same project has significantly increased.

As indicated in the charts below, this significant reduction on price will have a dramatic effect on project realization of returns on investment. CAPEX and/or OPEX reduction, "digging a smaller cash hole" and/or decreasing Cost of Goods Sold are methods that can mitigate this impact. Figure 1 shows the "Typical Venture Cash Flow Prior to the Oil Price Reductions.

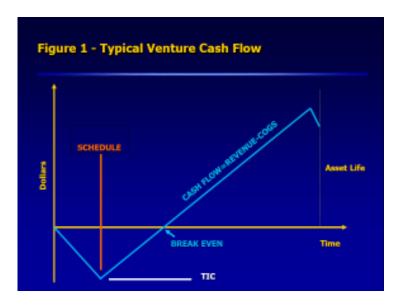
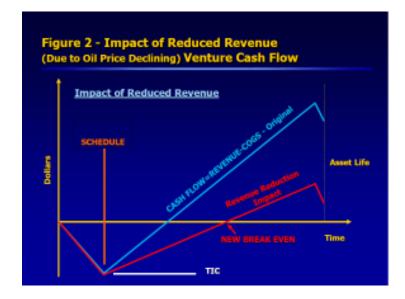


Figure 2 shows the impact of the revenue reductions caused by the large drop in Oil prices.



Although easier said than done, a disciplined and correct application of industry standard Best Practices would benefit today's changing project world. Best Practices are processes or methods that, when executed effectively, lead to enhanced project and asset performance. They can even result in savings on the order of approximately 12% to 16% of a project's Total Installed Cost and, in some cases, achieve even greater cost reductions.

Figure 3, on the next page, shows the impact of correctly applying Best Practices. The key is that it can no longer be a "Check the Box" exercise when implementing these practices (see Panorama Spring 2011). The impact of "mailing in" these assessments can range from simply embarrassing, when expected outcomes are not



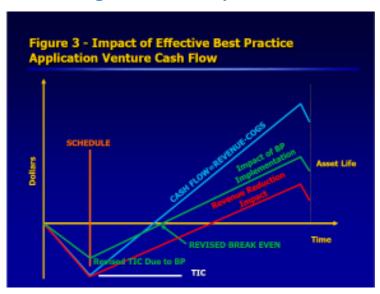
Al took early retirement at the end of 1998 from Caltex Petroleum, where he was the Manager of Engineering and Construction, to pursue his second career. This involved becoming a Senior Lecturer in Chemical Engineering at Cornell University and joining the consulting roster of Pathfinder, LLC.

While at Caltex, AI was involved in project management, technology management and management of technical personnel in the downstream sector of the petroleum industry, During his time at Caltex he held progressively responsible positions in domestic and international project environments, including the United States, Europe, the Middle East, Southeast Asia, China and Japan. As the Manager of Engineering and Construction for Caltex, AI was responsible for managing engineering and construction services for refineries and marketing facilities. This included oversight of FEL 1, 2 and 3 design efforts for a number of new facilities and revamp projects.

Since joining Pathfinder, AI has facilitated numerous Value Improving workshops for Oil & Gas, Petrochemical and Steel Industry clients in the US, Canada, Bahrain, Bolivia and Brazil. These included Waste Minimization, Design to Capacity, Constructability, Process Simplification, Design Standards & Specifications, Readiness to proceed reviews, Front End Design Packages and Predictive Maintenance. He has been an expert witness on various technical and execution claims.

At Cornell, Al heads up the senior capstone Plant Design Course and also teaches courses in Managing New Business Development, Process Control Strategies, Hydrocarbon Resources, Industrial Applications of Fluid Dynamics and Turbo-machinery. He has twice been invited to teach at the University of Canterbury in Christchurch, New Zealand as an Erskine Fellow. Al has a BS and a Master degree in Chemical Engineering from Cornell University and completed the MPE Program at the University of Pittsburgh Business School. He is also a Registered Professional Engineer in New Jersey. When Al is not consulting or teaching he's in the stands at various Cornell sporting events.

Executing Oil/Gas Projects continued...



achieved, to catastrophic, as when a key strategic project fails, resulting in devastating financial harm to the overall corporation. Inefficiencies in plant operations can also cause a deterioration of the company's profitability. This is even more essential due to declining revenues driven by the significant oil price reductions, as observed so far this year.

Some of the key Best Practices that will reduce the impact of volatility in oil prices are listed below.

- **Effective Execution Planning**
- Readiness Reviews conducted by the most experienced Subject Matter Experts (SMEs), whether "internal" or "external"
- Strict Adherence to existing project processes to insure meaningful Business Decisions/Project Gate Reviews
- Application of appropriate Value Improving Practices such as: Value Engineering / Constructability / Design to Capacity
- Appropriate Contracting Strategy development pre-award coupled with effective contract administration post-award
- Implementation of appropriate project control tools focused on principles and recommendations related to cost control, quality and schedule.
- Develop an accurate Execution Phase, Cost Estimate and Project Schedule which are powerful planning tools to be utilized in establishing realistic baselines and to evaluate project success and benchmark project performance.

For example, proper employment of a Phased Gate process, allows management to make informed decisions not only with respect to the viability of a specific project, but also as to which projects should continue to move forward, which should be cancelled/put on hold, or re-scoped in order to meet the changing economics. Application of standard processes and decision metrics encourages consistent business evaluations from a portfolio perspective.

Some Strategies that proper application of these aforementioned Best Practices enable are:

- Phased Implementation; only execute for what is needed and/ or committed for in the immediate future and "phase" in the longer term project deliverables in the future.
- Eliminate/reduce Project "Overlaps"; i.e., where possible finalize engineering by discipline before going to the field, thereby significantly improving execution quality and cost as incomplete/incorrect engineering packages are one of the primary causes of poor Construction productivity and project cost over runs.
- Employ expert internal project resources who have been freed up due to the cancellation or delay of other efforts as Centers of Excellence to assist project teams that continue to move forward with the implementation of such "Best Practices" as Peer reviews, augmentation of Gate Keeping teams, readiness assessments, etc.
- More detailed scrutiny and "due diligence" applied to assure that decision-making data and information bases are accurate and objective prior to funding of the next phase or overall project.

Not everyone is suffering from the volatility in oil prices. Conversely these less expensive energy prices have been fueling capital expansions in other industries such as Petrochemical, which currently has a huge portfolio of Mega Projects, especially in the US Gulf Coast region, due to attractive feedstock pricing. These projects are driven primarily by the much lower operating costs as a result of lower energy prices.

Therefore, even though lower oil prices are putting the brakes on certain projects (i.e., primarily in the Exploration and Production arena), other projects and industries could benefit. Previously, due to tremendous resource and material requirements driven by both large expansions in the Oil and Gas Industry coupled with the large expansions forecasted in Petrochemical Industry, some of these projects were suffering schedule delays and projecting large cost overruns heightened by the lack of availability of engineering, skilled field labor, shop space, supplier deliveries, etc. The cancellation and/or delay of many of the Exploration and Production projects will help to ease this situation, thereby allowing the previously mentioned efforts to move forward in a more efficient and less costly manner.

Many forecasts indicate that oil prices may rebound to somewhere between \$65- \$75/bbl. by the end of the year. Given the trends noted so far this year, the probability of achieving this recovery is anyone's guess. Regardless of this potential, the landscape for Upstream Oil and Gas project execution has been dramatically altered for the foreseeable future. Effective organizations can mitigate the negative impact to their bottom line by correctly applying Best Practices and through effective modifications to the execution strategy for ongoing projects, and reevaluation of current project portfolios.

In subsequent issues of Panorama, we will detail how application of these Best Practices can specifically help your projects.

Project Management Training Courses

CII Professional Development Continuum

Pathfinder, LLC and the Construction Industry Institute are proud to offer this 5-day, three-module professional development continuing education session for the project management community. This program is a resource to help organizations plan the development of new construction project managers (those who have three to five years of experience). The Professional Development Continuum Plan (Project Manager Level) illustrates how CII publications, education modules, online courses, and instructor-led courses taught by CII Registered Education Providers address competency areas across the project life cycle. These project management training sessions will focus on the following areas: project management orientation, project controls overview, contract administration and project management communication.

Any of the following courses can be CUSTOMIZED and presented on location to meet the needs of your project team.

Project Management Orientation (1 Day)

This module will provide an overview of the roles and responsibilities of the owner and contractor's project manager. Attendees will experience the perspective of the worldwide project planning and

execution environment and how project management must react to changes in this ever-evolving industry. Attendees will also have the opportunity to better understand the function of the project manager and how creating an environment where others can work efficiently is the primary role.



This module will provide attendees with an overview of the overall project controls process and how this integrates with the project delivery process. Project control planning aspects such as scope definition, cost management and schedule management will be broken down into topics to include cost estimating, planning, cost control, and schedule management. Supporting these topics will be discussions on scope control and change management. Aspects such as productivity, performance measurement and earned value will also be addressed.

Contract Administration (2 Days)

This module delivers the overall contracting process from contract strategy selection through the development of contract documents and contract administration. Lump sum, reimbursable, unit prices and incentive contract compensation approaches will be addressed, as well as contractor pre-screening, bid review and negotiations. Attendees can expect to discuss worldwide engineering and construction activity including the evolving contractor community and resource availability.

DATES AND LOCATIONS

Each 5-day training program will be offered in the following 2015 presentation schedule:

April 20-24, 2015 - Houston Area May 11-15, 2015 - Calgary, Canada June 8-12, 2015 - Houston Area September 21-25, 2015 - Calgary, Canada November 2-6, 2015 - Houston Area

The Bundled Option

Combine all 3 of the above mentioned courses for a comprehensive 5-day, three-module professional development program.

Project Management Communication (2 days)

In this training, participants are exposed to the skills they need to analyze and disseminate all relevant project information in an effective and timely manner, and to prepare for and conduct project meetings and correspondence. They learn how to develop a communication management plan and acquire techniques for improving the communication of information to all project stakeholders. Topics include: Targeting an Audience, Addressing perceived needs, Identifying actions that need to be taken and Establishing timetables for action.

DATES AND LOCATIONS

This training program will be offered in the following 2015 presentation schedule:

May 18-19, 2015 - Calgary Canada

November 9-10, 2015 - Houston Area



Pathfinder has been authorized and approved by the Construction Industry Institute (CII) as a Registered Education Provider (REPP) of CII documentation and materials. Pathfinder will build CII tools and references as appropriate, throughout the course customization process.

Pathfinder News

PMI-SAC Professional Development Conference - On November 25, 2014 in Calgary, Canada, Scott Diehl, Executive Associate for Pathfinder, presented the findings of the EPC Roundtable from May of 2014. The topic of discussion was "Can BD and Project Teams Play Nice in the Sandbox?" Over 80 were in attendance. There was great interaction with the audience who seemed to have been personally affected by the practices within their companies during project development. The next PMI-SAC EPC Roundtable will take place May 2015.

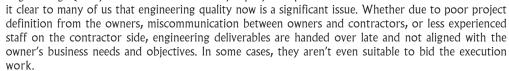
CURT Labor Mitigation Summit - In Houston, TX on November 11 & 12, Jim Blevins, Director for Pathfinder, attended the Summit which was focused on brainstorming ideas for the current and upcoming labor shortage. Several innovative and some common sense ideas came out of the Attracting and Retaining Resources breakout session. Suggestions ranged from changing the hours in the work week to "real" restooms to even using ex-cons to fill in some of the gaps.

2015 CURT National Conference - Paul Williams and Steve Cabano attended the 2015 CURT Conference in Phoenix Arizona, 9 – 11 February 2015. There were approximately 500 attendees. Issues around Owner Business Case Development and Innovative Contracting Approaches were a couple of the topics discussed.

Pathfinder Celebrates 9 Years of Membership with the Construction Industry Institute - The Construction Industry Institute is a consortium of more than 130 leading owner, engineering-contractor, and supplier firms from both the public and private arenas. These organizations have joined together to enhance the business effectiveness and sustainability of the capital facility life cycle through CII research, related initiatives, and industry alliances. A learning organization with a wealth of knowledge and information, CII is unique in the engineering and construction industry and falls right in line with Pathfinder's dedication to the collection, preservation, enhancement, application and transfer of this vital and dynamic body of knowledge.

Go4theGoal Holiday Donation Tree - Pathfinder participated in Go4theGoal's Gift Card Tree Drive. Go4theGoal Foundation's unwavering mission is to help make the lives of children affected by cancer as normal as possible by providing financial support, developing and implementing unique hospital programs, funding Grants for innovative research, and granting personal wishes.

Chemical Processing Article - Keep an eye out for the April 2015 edition of Chemical Processing for an article by Stephen Cabano entitled "Boost Engineering Quality". The last round of major project expansions has made



Pathfinder Holiday Party - Pathfinder's annual Holiday Party was held on January 23rd. Steve and Diane Cabano were gracious enough to open their house which provided for a relaxed cocktail party atmosphere.

Greater Philadelphia Chamber of Commerce (PGCC) - Pathfinder is now a member of the Greater Philadelphia Chamber



of Commerce which is the 4^{th} largest chamber in the country covering 11 counties, 5 in Pennsylvania, 5 in Southern New Jersey and New Castle County Delaware.









PM PANORAMA is published by Pathfinder, L.L.C. 11 Allison Drive, Cherry Hill, New Jersey 08003 Ph: (856) 424-7100 Fax: (856) 424-6414 info@pathfinderinc.com www.pathfinderinc.com Publisher: Pathfinder, LLC Editor: Christine McIntyre

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PATHFINDER

Conference Activity

Energy Construction Forum

March 3-4, 2015 Galveston, TX Sponsoring Project Management Track

AACEI Del Val Chapter Meeting

March 11, 2015
Philadlephia, PA
Presenting: Owner Gaps in Project
Controls: An Industry Overview

AACEI Northeast TCM

March 20, 2015
Valley Forge, PA
Presenting: Can PM Contractors Fill
Owners' Cost Engineering Needs for
Major Capital Projects

FIATECH

April 13-16, 2015
Boca Raton, FL
Presenting: The Effective Use of Risk
Analysis Systems in Project Planning
and Execution

AACEI New Orleans Chapter Meeting

April 22, 2015 New Orleans, LA Presenting: Project Impossible

Petrochemical Engineering and Construction Conference 2015

June 16-17, 2015 New Orleans, LA Panel Moderator

AACEI 2015 Annual Meeting June 28 - July 1, 2015

Las Vegas, NV
Presenting:
What's so Important About an Owner's
Project Control Plan?
and
"We Don't Need Project Control" -

"We Don't Need Project Control " -Gambling on Your Project Outcomes

Seminars:

Project Control from an
Owner's Perspective
and
Advanced Project Controls from an
Owner's Perspective

Panel Members:

Steve Cabano is a member of the Mining panel.